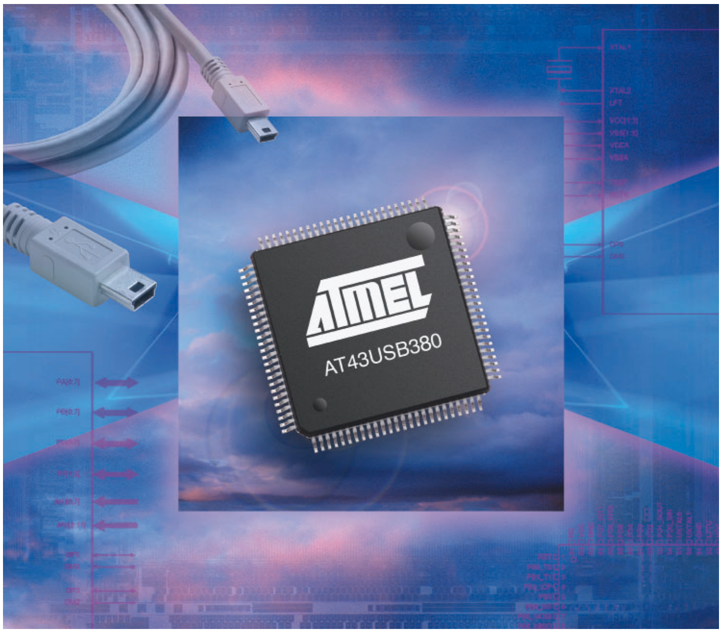
USB Solutions

AT43USB380

USB 2.0 Full Speed OTG/Host/Function Processor

Plug & Play On-the-Go Solution for Embedded Applications

AT43USB380: The Beauty of Simplicity



Visit: http://www.atmel.com/ad/plugplayotg

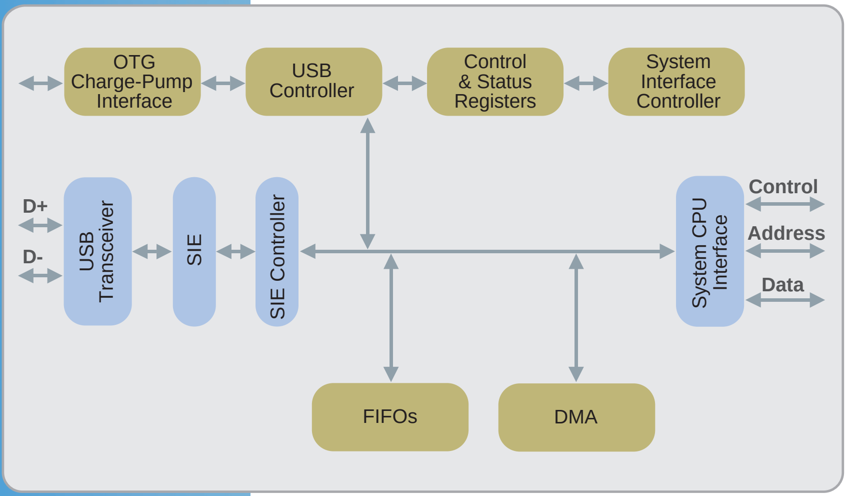
Atmel's AT43USB380 is an all-in-one USB solution designed specifically to hide the complexity of adding OTG/host functionality to embedded designs. It features:

- An intelligent OTG/host/function processor capable of managing USB transactions without system processor intervention
- A processor/RTOS independent software suite that includes standard USB class device drivers and simple Application Programming Interface (API) for custom driver development

With the AT43USB380, in-depth knowledge of USB protocol is no longer a prerequisite for your USB development.

HARDWARE BLOCKS

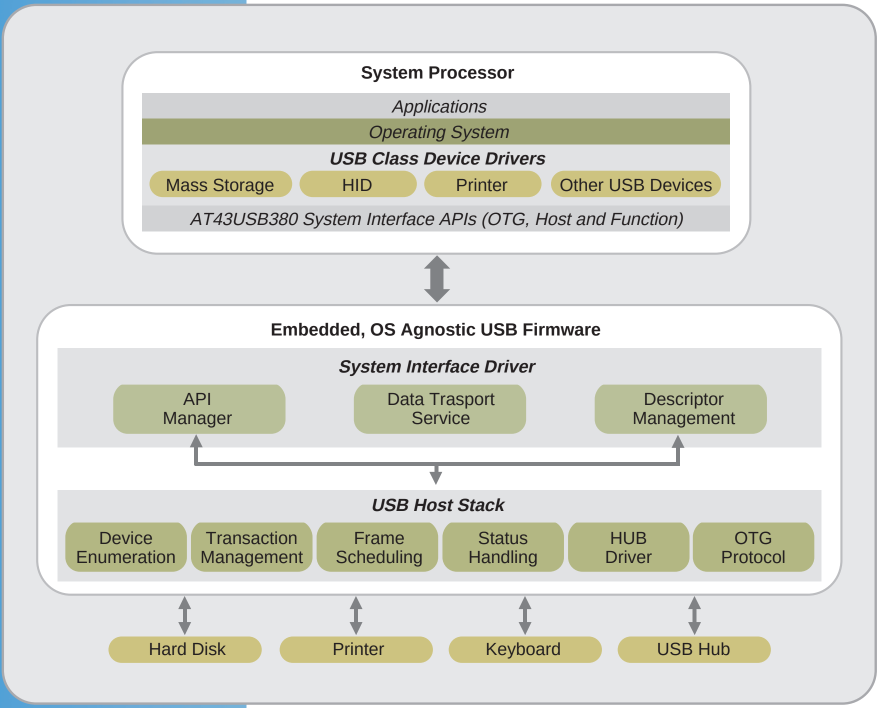
The AT43USB380 is a memory-mapped USB co-processor capable of managing USB transaction and data flow autonomously. Key AT43USB380 modules include:


OTG Charge-Pump Interface
USB Controller
Control & Status Registers
System Interface Controller
D+
D-
USB Transceiver
SIE
SIE Controller
System CPU Interface
Control
Address
Data
FIFOs
DMA

- **Dedicated controllers** handling USB protocol and data flow to and from the system processor
- **Full-speed host/function port**
- **OTG charge-pump interface** providing OTG physical signaling
- **Control and data FIFO blocks** with separate Rx and Tx buffering to ensure maximum throughput
- **32-/16-/8-bit system processor interface** with DMA capability

SOFTWARE ARCHITECTURE

USB application development is made easy with the tight integration of AT43USB380 hardware and software. The platform (processor/RTOS) independent AT43USB380 software suite features:


System Processor
Applications
Operating System
USB Class Device Drivers
Mass Storage
HID
Printer
Other USB Devices
AT43USB380 System Interface APIs (OTG, Host and Function)
Embedded, OS Agnostic USB Firmware
System Interface Driver
API Manager
Data Trasport Service
Descriptor Management
USB Host Stack
Device Enumeration
Transaction Management
Frame Scheduling
Status Handling
HUB Driver
OTG Protocol
Hard Disk
Printer
Keyboard
USB Hub

- **On-chip USB Firmware stack** comprised of USB host, function, hub and OTG (HNP and SRP) modules
- **ANSI C compliant system interface library APIs** that serve as the building blocks of USB device drivers
- **Standard USB class device drivers** presented to the system designers in the form of ANSI C compliant APIs

Flexible Hardware Design

Instant USB Point-to-Point Solution for Embedded Devices

- Three operating modes: OTG, standalone host and standalone function
- Configurable system bus interface suitable for 32-/16-/8-bit system processors
- Generic design compatible with any standard USB class and proprietary devices

Intelligent Architecture

Minimal Consumption of System Resource

- Enumeration without system processor intervention
- Automatic USB frame scheduling and transaction management without interrupts to the system processor
- High-speed DMA data transfer across system bus

Comprehensive Software Suite

No USB Expertise Required

- Standard USB class drivers
- Easy-to-use system APIs to build custom USB device drivers
- On-chip USB HUB driver

Minimal Custom Engineering

Fastest Time-to-Market

- No need to develop and port USB software
- No time wasted for compatibility testing with different classes of USB devices from different vendors

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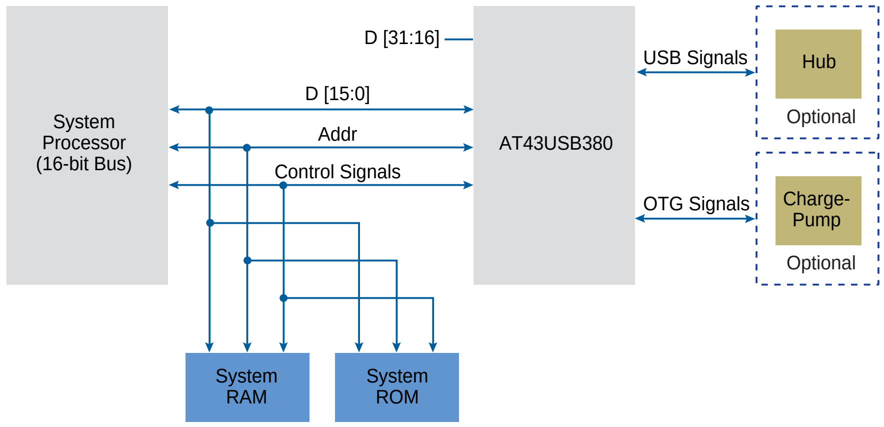
Development Kit

The AT43DK380 is a complete starter kit and development system for the AT43USB380 OTG/host/function processor.

AT43DK380 Development Kit Features

- AT43USB380 reference design board
  - OTG/host/function processor
  - 1 Mbyte Flash ROM expandable to 2 Mbytes
  - 2 Mbytes static RAM
  - 4-Port USB full-/low-speed hub
  - OTG charge-pump and voltage comparator
  - USB type A, mini A/B ports
  - 20-pin JTAG interface connector
  - Expansion connector to support 32-/16-/8-bit system processor
- System processor daughter cards
- USB software suite
  - USB stack
  - System library API set
  - Standard USB class drivers
- USB clinic diagnostic and debugging tool

Typical System Processor Connection



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