

UINF-0021 USB 1.1/2.0

Device Controller

(Medusa16)

Features

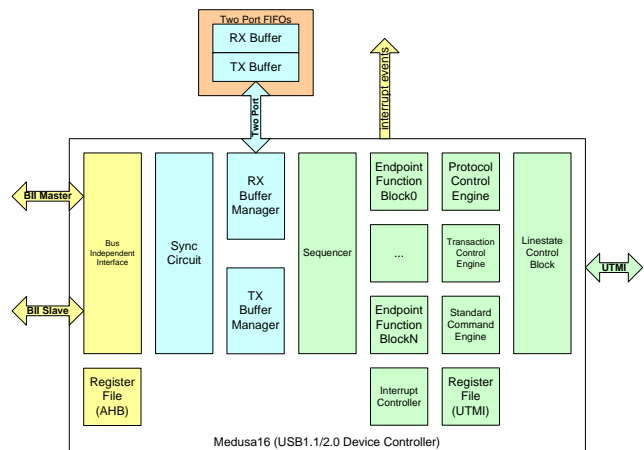
- ◆ Compliant with USB Protocol Revision 1.1/2.0
- ◆ Compliant with UTMI Specification Version 1.05
- ◆ Supports all of USB standard commands
- ◆ Supports suspend mode and remote wake-up resume
- ◆ Supports USB2.0 high-bandwidth endpoint
- ◆ Supports USB2.0 OTG Device Feature.
- ◆ Support of Bus Independent Interface (BII) as application system interface
- ◆ User configurable Endpoint/Interface information
- ◆ Up to 16 configurations
- ◆ Up to 16 interfaces for each configuration
- ◆ Up to 16 alternate settings for each interface
- ◆ Up to 16 active bi-directional logical endpoints
- ◆ Endpoint0 is for USB standard control transfer.
- ◆ Endpoints 1-15 (IN and OUT) can be programmed to one of bulk read, bulk write, ISO read, ISO write, interrupt read or interrupt write.
- ◆ Option to enable the SyncFrame Command or STALL it.
- ◆ Option to enable Auto ACK response for vendor defined control status stage transaction
- ◆ Support of FrameNumber and SyncFrameNumber Register
- ◆ Support of Class/Vendor commands by passing the commands to the application system.
- ◆ Option to support AMBA AHB Master and AHB Slave application program interface
- ◆ Support of Synchronous Circuit between UTMI clock and application clock. (Extra synchronization circuit is not required)

- ◆ Support of single receiver buffer for all OUT and SETUP transactions.
- ◆ Support of single transmit buffer for all IN transactions.
- ◆ Support both of post-buffering and pre-buffering mechanism for IN transactions.
- ◆ Support of Interrupt Request Interface

Overview

The Medusa16 is a highly configurable USB device controller. The user can set the information of configuration, interface and endpoint without hardware modification. For example, the buffer size of endpoints, the transfer type of endpoints, the direction of endpoints, the logical endpoint number, the logical interface number, and so on. The Medusa16 faces two clock domains, UTMI clock domain and application system clock domain. The synchronization circuit and buffer management are implemented in the Medusa16. User never needs to suffer from the synchronization or buffer control issues. For BII interface, the embedded DMA engine and IN transaction pre-buffering mechanism will speed-up the data transfer between the Medusa16 and the application system.

Block Diagram



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Description

The customers can access the Medusa16 from the application system via Bus Independent Interface (BII) interface. An AMBA AHB wrapper circuit is needed for the AMBA based uP application system. Medusa16 provides two BII channel. One BII slave interface is for registers access and flow control, the other BII Master interface is for Data transfer.

Deliverables

- **One-Page Summary**
- **Datasheet (Preliminary User's Manual)**
- **User's Manual**
- **Verification Guide**
- **Integration Guide**
- **Programming Guide**
- **Installation Guide**
- **Synthesizable RTL**
- **Synthesis Scrip Files**
- **Regression List**

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