

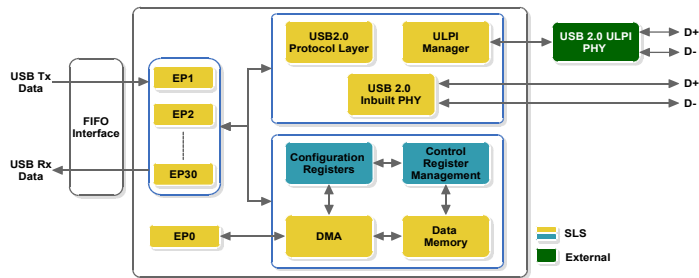
IP Core

USB 2.0 Device, FIFO Interface (USB20HF)

USB 2.0 device, FIFO interface (USB20HF) IP Core provides FIFO interface for endpoints and ULPI interface for Host communication. It supports 15 IN and OUT endpoints as per the USB standards which are configurable in Bulk, Interrupt and Isochronous modes as per the requirement. The core supports High Speed (480 Mbps), Full Speed (12 Mbps) and Low Speed (1.5 Mbps) functionality. It comes with three pre-configured endpoints - Control, Bulk IN, and Bulk OUT.

It has been designed to provide simplicity along with high throughput by providing easy to use FIFO interface to transfer the data over non-control endpoint.

Architecture



Features

- Supports High Speed (480 Mbps), Full Speed (12 Mbps) and Low Speed (1.5 Mbps) modes
- Supports Control, Bulk, Interrupt and Isochronous transfers
- Supports ULPI Interface
- Inbuilt PHY support incase user needs only Full speed or Low speed mode
- Simple FIFO interface to transfer data over non-control endpoint
- Capable to support up to 31 endpoints (1 default control endpoint + 15 IN/OUT endpoints) can be of type Bulk, Isochronous or Interrupt
- Supports High speed test modes (Test J, Test K, Test SE0 NAK and Test Packet)
- Supports Intel FPGAs (Support for Microchip and Lattice FPGA can be made available on request)

Licensing

- **OpenCore Plus Evaluation:** Evaluation license at no cost
- **Full:** Project based Perpetual License
- **Maintenance:** 20% of License fee from next year to continue technical support and getting updates for IP Core

Support

- IP integration support available with the purchase of full version
- Core customization support available at additional cost

Implementation Results

Supported Families	Resource Utilization	Memory Blocks	Performance (Fmax) MHz
Arria 10 GX	975 ALM	4 M20K	243.49
Cyclone 10 LP	2523 LE	4 M9K	149.88
Arria V GX	750 ALM	5 M10K	60
Cyclone V GX	945 ALM	4 M10K	122.5
Stratix V	967 ALM	4 M20K	243.13
MAX10	2519 LE	4 M9K	162.68

Note: The implementation results are for pre-configured endpoints only.

Deliverables

Contents	Eval	Full
OpenCore Plus Evaluation	✓	
Full Version: Project based perpetual License with one (1) year post sales support. Other licensing schemes are also available.		✓
Demonstrations: 1) Streaming 2) Loop-back	✓	✓
Reference Design	✓	✓
Time-limited programming file generation	✓	
Full programming files generation support		✓
Windows Reference Drivers (object code)	✓	✓
Utilities: 1) USB Device Validator	✓	✓
Documentation: 1) IP Core User Guide 2) Host BFM User Guide 3) Windows API User Guide	✓	✓

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