

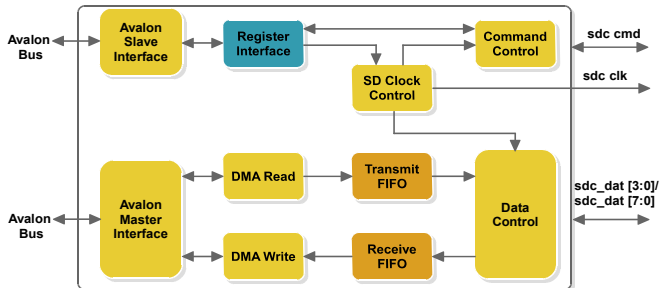
IP Core

SD/eMMC Host Controller

The SD/eMMC Host Controller IP Core implements the SD Physical Layer v3.0 and eMMC Physical Layer v4.51 compatible Host Controller which supports standard SD Card, SD High Capacity Card (SDHC), SD Extended Capacity Card (SDXC) and eMMC.

Fully register based configuration makes it very easy to integrate in wide range of application. The SLS SD/eMMC Host Controller IP Core gives full support for Altera's SOPC and Qsys based system and provides communication between Altera's Avalon Bridge and Secure Digital (SD) Card and eMMC.

Architecture



Features

For SD:

- Follows SD Physical Layer Specification v3.0
- Supports SD Card, SD High Capacity Card (SDHC) and SD Extended Capacity Card (SDXC)
- Supports 1-bit and 4-bit data interface
- Supports SDR12, SDR25, DDR50 interface
- Supports multiple clock selection using software
- Supports voltage switching functionality

For eMMC:

- Follows eMMC Physical Layer Specification v4.51
- Supports 1-bit, 4-bit and 8-bit data interface
- Supports DDR interface
- Supports interrupt mode
- Supports multiple boot mode

General:

- Supports selection between SD and eMMC
- Supports CRC7 and CRC16 generation and verification on Hardware
- Supports multiple block transfer
- Supports power saving mode
- Supports integrated 32 bit DMA interface
- Supports interrupt driven functionality
- Avalon bus Compliant

Note: * Standalone - without Avalon bus interface IP Core is also available on request.

Support

- IP integration support available with the purchase of full version
- Additional support on chargeable basis for a period of 3 months or more
- IP Core modification support available at additional cost

Licensing

- OpenCore Plus Evaluation** : 1 month evaluation license at no cost
- Full** : 1 Year development license with full version purchase for single project and single site
- Renewal** : OpenCore Plus Evaluation license update at discounted price

Implementation Results

Host Controller	Interface	Supported Families	Resource Utilization	Memory Blocks
SD	SDR	Cyclone IV	2520 LE	2 M9K
		Cyclone V	1060 ALM	2 M10K
	DDR	Cyclone IV	3200 LE	3 M9K
		Cyclone V	1300 ALM	3 M10K
eMMC	SDR	Cyclone IV	3100 LE	2 M9K
		Cyclone V	1250 LE	2 M10K
	DDR	Cyclone IV	4210 LE	3 M9K
		Cyclone V	1700 ALM	3 M10K

Note: The implementation results may change upon core revision

Deliverables

Contents	Eval	Full
OpenCore Plus Evaluation: One (1) month evaluation license at no cost	✓	
Full Version: One (1) Year development license with full version purchase for single project and single site. Note: Other licensing schemes are also available.		✓
Demonstrations: 1) Mass Storage (not a part of package, available on request) 2) SD Card Performance Test on CoreCommander	✓	✓
Time-limited (4 hours) SOF generation support for CoreCommander (3c25) reference design	✓	
Full programming files generation support for CoreCommander (3c25) reference design		✓
Nios II Sample Application: FAT(16/32) File System (RockBox)	✓	✓
Embedded Driver for accessing SD Card and eMMC: • Nios II HAL driver (Object Code) • Linux driver (Object Code)	✓	✓
Documentation: 1) IP Core user guide 2) Hardware and Simulation tutorial 3) HAL API user guide	✓	✓

Verification

- SD/eMMC Host Controller IP Core is verified on CoreCommander board and USB 3.0 development board.

Download the evaluation version for the core from <http://www.slscorp.com/ip-cores/memory/sd-emmc-host-controller.html>