



Performance Report

SD Host Controller IP core

Date: July 20, 2010 Ver: 1.0

This report is intended to provide the information about the SLS SD Host Controller IP core performance on CoreCommander board.

System Configuration:

Test Setup	
Development Board	CoreCommander (rev 1b)
CPU/Memory Configuration	Nios II/f 100 MHz/ 256 Mb SDRAM
Cache Memory	4Kbyte Instruction Cache
SD Host Controller	
IP Core	SLS SD Host Controller
Version	2.5
SD Card Frequency	50 MHz
Interface Mode	4-bit
SD Card	
Card Manufacturer	SanDisk
Size	256 MB to 16 GB
Platform and Driver	
OS	Windows
Software tool	Quartus II and Nios II IDE v8.1
Driver	SLS SDHC HAL
Driver Version	3.0.0

Memory Data Performance Test:

The memory data performance test is conducted using SD host controller performance design which uses performance counter to measure the read/write speed to/from SD card. Figure 1: shows the block diagram of the performance design used for memory data performance test. The raw data stored in SDRAM is read/write on specified address for specified number of blocks of SD card using 4 bit interface mode. For one block the length of data is 512 bytes. Table 1: shows the performance report carried out on 4 GB (class 6) and 8GB (class 4) SD card.

Table 1: Memory Data Performance Report			
SD Card		Speed (Mb/s)	
Card Size	Block Depth	Read	Write
8GB (Class 4)	20K	193	95
	4K	192	43
	1	10	0.39
4GB (Extreme III) (Class 6)	20K	193.3	171.2
	4K	192	170
	1	11.19	5.69

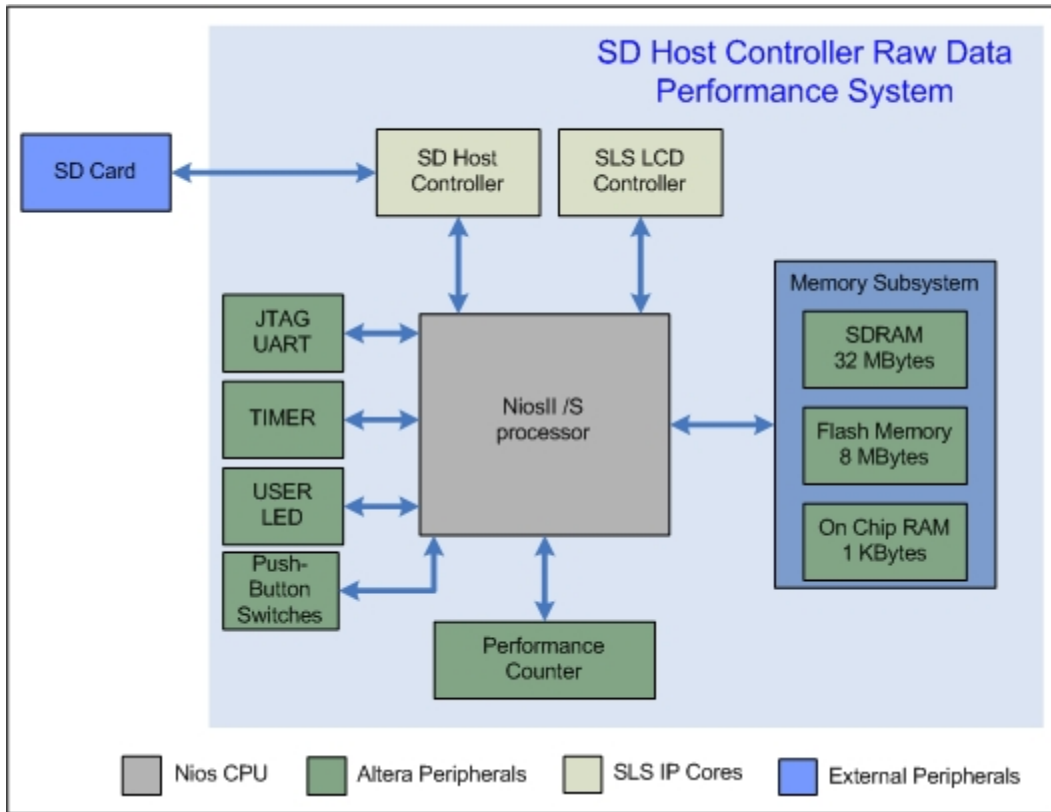


Figure 1: SD Host Controller Memory Data Performance System Block Diagram

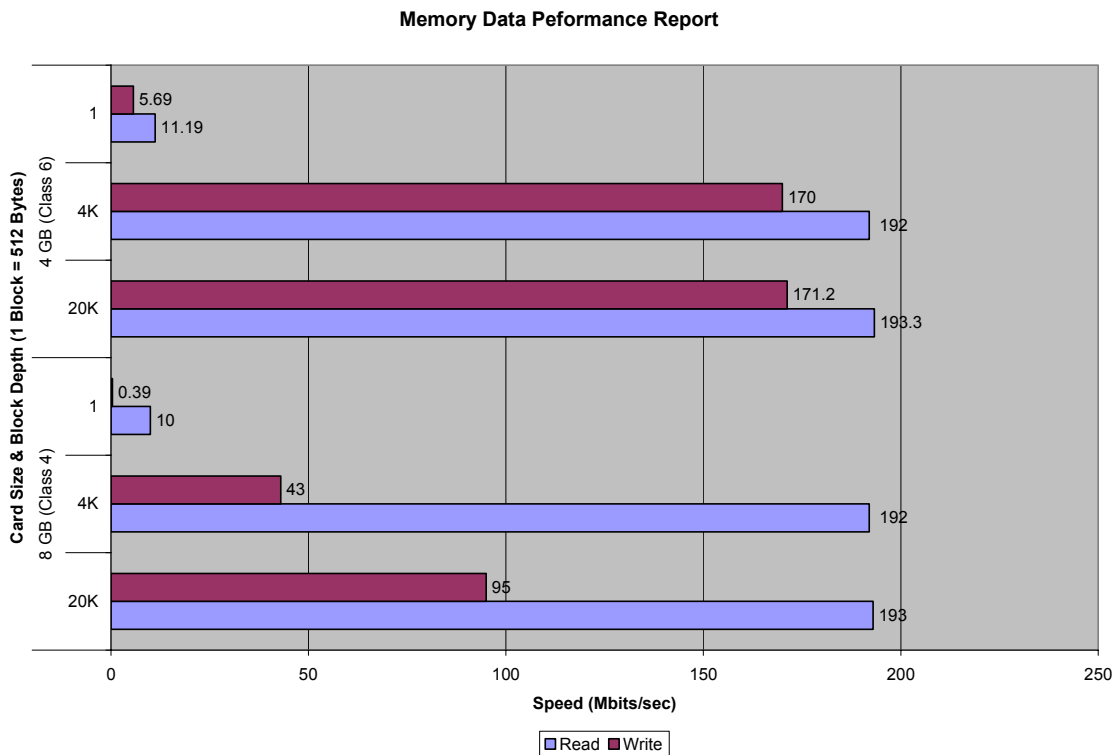


Figure 2: Raw Data Performance Report

Mass Storage Performance Test:

Figure 3 shows the block diagram of the performance system used for mass storage test. SLS USB 2.0 Device IP Core is used to transfer the data between SD card on the board and PC. A large size file read/write on the SD card and using performance counter the transfer speed is measured. Table 2: shows the performance report for mass storage application performed for different size SD card.

Table 2: Mass Storage Application Performance Report		
SD Card Size	Speed (Mb/s)	
	Read	Write
256 MB	77	35.5
512 MB	69	19.3
1 GB	84.8	67
4 GB (class 6)	106	44
8 GB (class 4)	132	77
16 GB (class 6)	134	72
4 GB Extreme III (class 6)	132	116

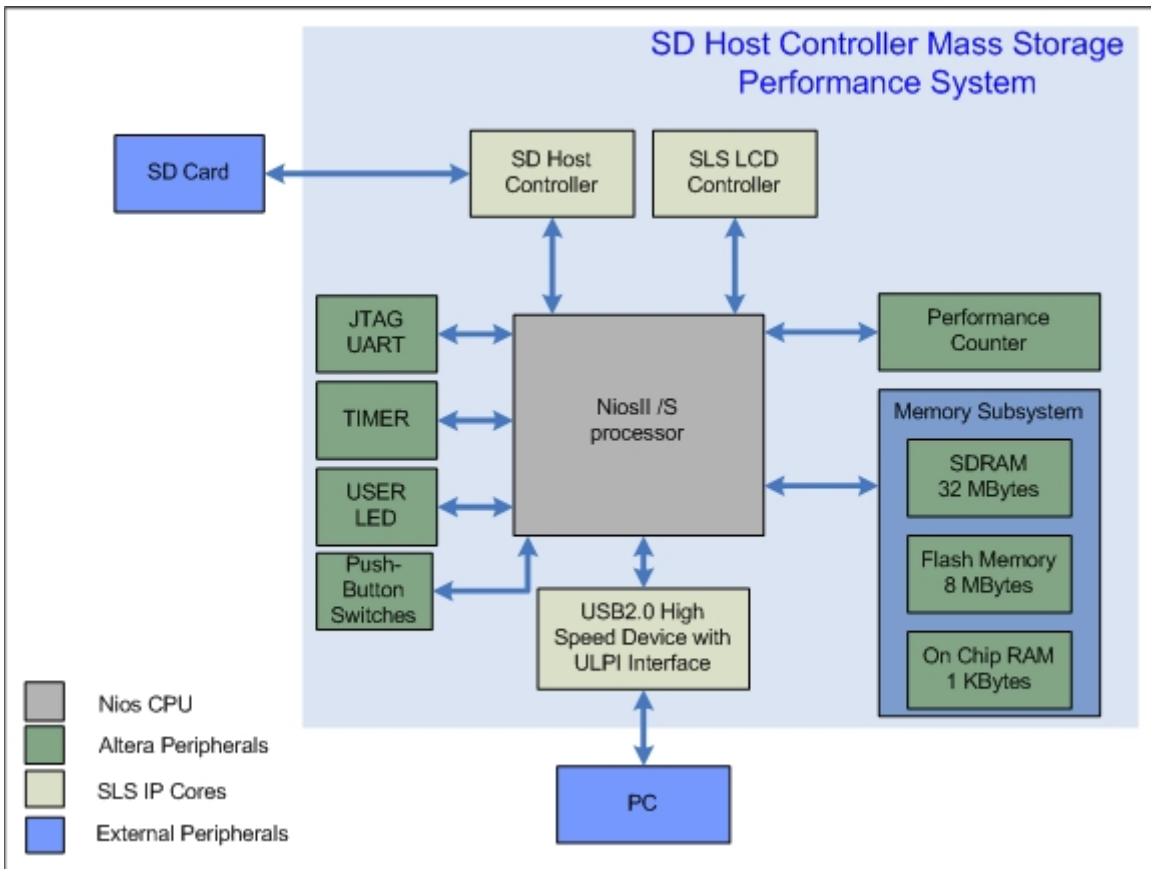


Figure 3: SD Host Controller Mass Storage Performance System Block Diagram

Mass Storage Performance Report

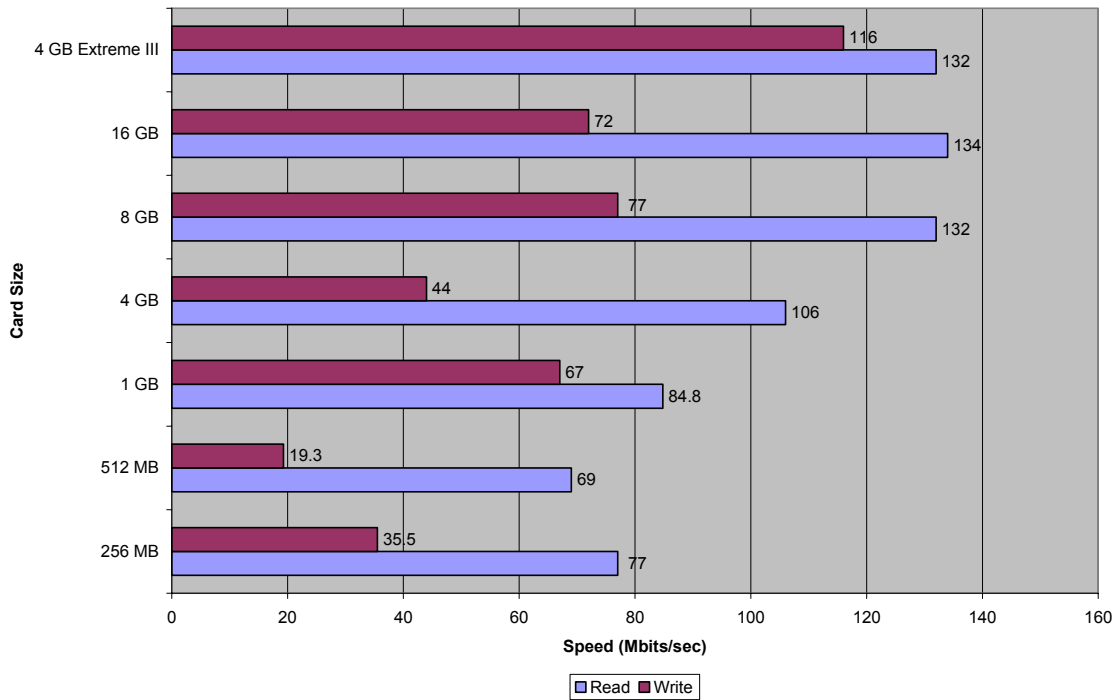


Figure 4: Mass Storage Application Performance Report

For more information, please contact support@slscorp.com.

Related link:

For CoreCommander Development Board, please refer <http://www.slscorp.com/pages/corecommander.php>.

For SLS USB 2.0 Device IP core, please refer <http://www.slscorp.com/pages/ipusb20sls.php>.

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