SATA IP
Serial ATA Transport&Link Layer IP Core

high-reliability & high-performance IP core proven by NASA!!
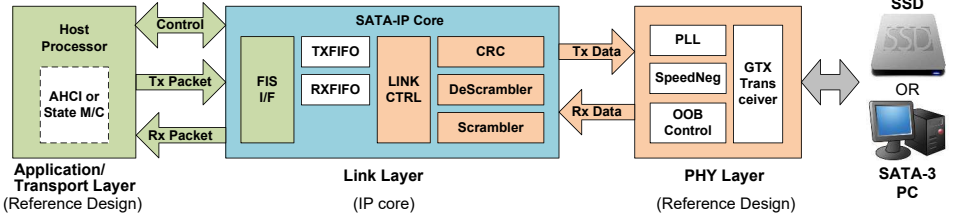
6G bps

SATA IP core compliant with the Serial ATA specification revision 3.0 and works on Xilinx UltraScale, 7-Series, Virtex5/6 and Spartan-6 device. This IP core provides link layer. Design Gateway provide transport layer and 150MHz GTX physical layer design for 6.0Gbps SATA3 interface as reference design. It can connect with SATA3 SSD/HDD directly without external PHY chip. The IP core license includes the reference design for Xilinx FPGA boards to shorten development time and reduce the cost.
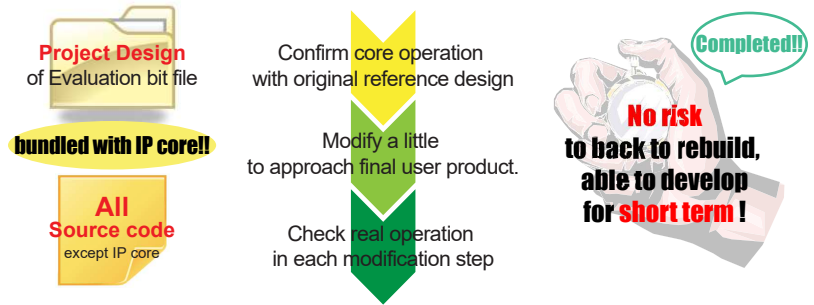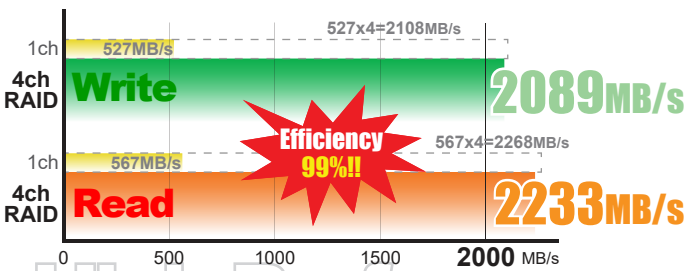
Block diagram

RAID evaluation on KC705 with 4 SSDs

Features

- **Compliant with SATA 3.0 6Gbps**
- **Support both Host and Device**
- **AHCI for Linux boot up from Zynq-7000**
- **FAT32 access without CPU**
  * with optional HOST-IP and FAT32-IP
- **Free evaluation before purchasing**
  IP core Evaluation Demo are available on youtube
- **Reference Design is contained with IP core license**

Enhanced development support

Project Design of Evaluation bit file
bundled with IP core!!
All Source code except IP core

Confirm core operation with original reference design
Modify a little to approach final user product.
Check real operation in each modification step

Completed!!
No risk to back to rebuild, able to develop for **short term** !

Suitable for RAID System

High-Efficiency Loss less RAID system !!

527x4=2108MB/s
1ch 527MB/s
4ch RAID **Write** **2089**MB/s
Efficiency 99%!!
567x4=2268MB/s
1ch 567MB/s
4ch RAID **Read** **2233**MB/s

SATA HOST IP 4ch RAID Transfer performance on KC705

Able to build RAID system by Small Resource !!

Name	Slice LUTs (218600)	Slice Registers (437200)	F7 Muxes (109300)	F8 Muxes (54650)	Slice (54650)
HSATARaid0x4	8142	8637	62	1	3436
u_AllIdenRam[0].u_IdenRam (Ram128x32)	1	0	0	0	1
u_AllIdenRam[1].u_IdenRam (Ram128x32_HD172)	1	0	0	0	1
u_AllIdenRam[2].u_IdenRam (Ram128x32_HD179)	1	0	0	0	1
u_AllIdenRam[3].u_IdenRam (Ram128x32_HD186)	1	0	0	0	1
u_CpuLAxi2Reg (LAxi2Reg)	209	195	18	0	116
u_IP2UFf (FIFO512x128)	51	63	0	0	28
u_SATARAID0x4IP (SATARAID0x4IP)	6769	7056	43	0	2839
u_HSATAIP0 (HSATAIPMt)	1568	1628	10	0	716
u_HSATAIP1_3[1].u_HSATAIP1 (HSATAIPSI)	1551	1581	10	0	658
u_HSATAIP1_3[2].u_HSATAIP1 (HSATAIPSI_0)	1551	1581	10	0	657
u_HSATAIP1_3[3].u_HSATAIP1 (HSATAIPSI_1)	1552	1586	10	0	675
u_Raid0x4 (Raid0x4)	302	444	3	1	139
u_Tx...	27	31	0	0	12
u_Tx...	35	28	0	0	14
u_TxRxFf[1].u_RxFf (FIFO128x128_2)	27	24	0	0	13

4ch RAID Total Resouce Usage

Resource consumption of SATA HOST IP 4ch RAID reference design for KC705

Product Line up

IP core

SATA-IP-KU	1 project Netlist License for **Kintex UltraScale**
SATA-IP-KT7	1 project Netlist License for **Kintex 7**
SATA-IP-ZQ7	1 project Netlist License for **Zynq 7000**
SATA-IP-ZQ7-AHCI1	**AHCI** 1 project Netlist License for **Zynq 7000**
SATA-IP-AT7	1 project Netlist License for **Artix 7**
SATA-IP-VT7	1 project Netlist License for **Virtex 7**
SATA-IP-HOST-X	**HOST IP** for SATA-IP. Purchase with SATA-IP core
SATA-IP-FAT32-X	**FAT32 file system** for SATA-IP. Purchase with SATA-IP core
SATA-IP-exFAT-X	**exFAT file system** for SATA-IP. Purchase with SATA- IP core

Accessories for evaluation

AB02-CROSSOVER	**SATA- SATA crossover board for SATA Device IP evaluation**
AB09-FMCRAID	**FMC-SATA(10ch) adapter board for SATA-IP with RAID evaluation** * Available on Mouser
AB14-CLKSMA	**SMA clock module for AC701**

SATA-IP core for Virtex-5, Virtex-6and Spartan-6 are also available.
Please ask us about Multi-License, Evaluation License and Maintenance support License.
For more detail and technical information on our web site http://www.dgway.com/SATA-IP_X_E.html

Design Gateway Co.,Ltd.