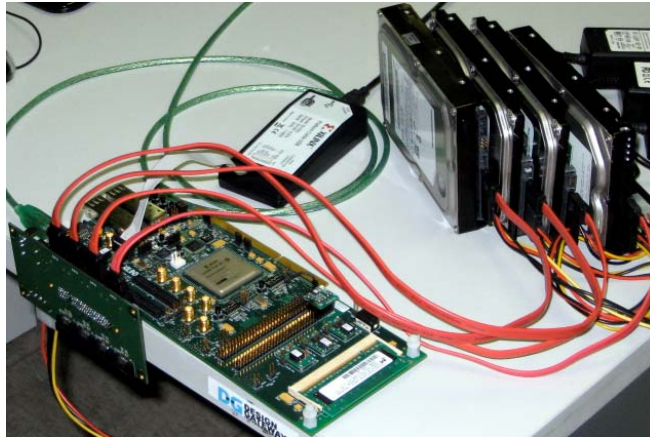


## RAID prototype system introduction



**SATA-IP RAID system introduction using ML555**

2009/06/22

Design Gateway

Page 1

## System Outline

- **ML555 platform system.**
- **Use adapter board for prototype development.**
- **Apply PCIe of ML555 to SATA channel.**
- **Connect 4 HDDs with adapter board.**
- **Show read/write result to PC via RS232C.**
- **Execute test pattern read/write.**
- **Display measured transfer performance.**

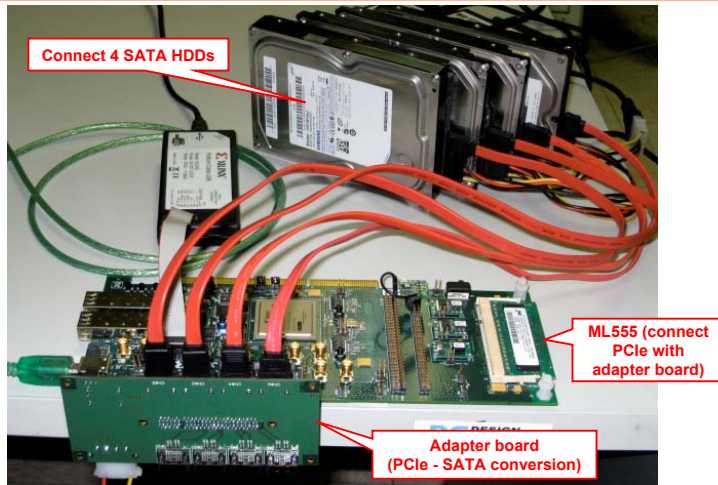


2009/06/22

Design Gateway

Page 2

## Prototype System



**RAID prototype system using ML555 + adapter board**

2009/06/22

Design Gateway

Page 3

## Adapter Board

- Adapter board with 8 SATA Host connectors.
- Connector for 8-lane PCIe of ML555 connection.
- One year charge free rental for SATA-IP user.

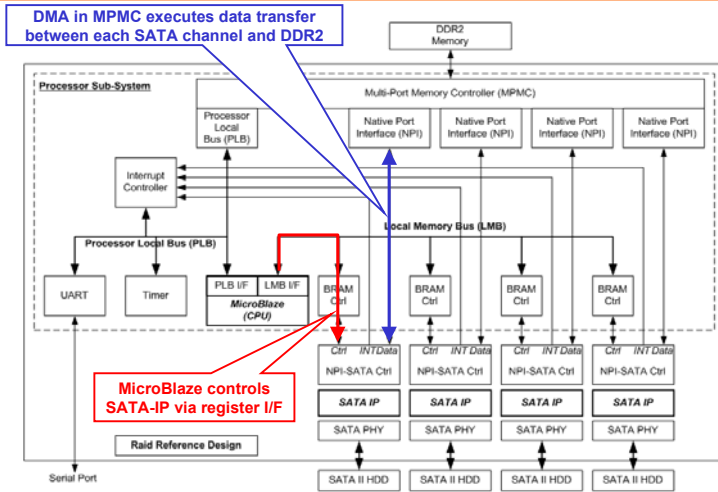


2009/06/22

Design Gateway

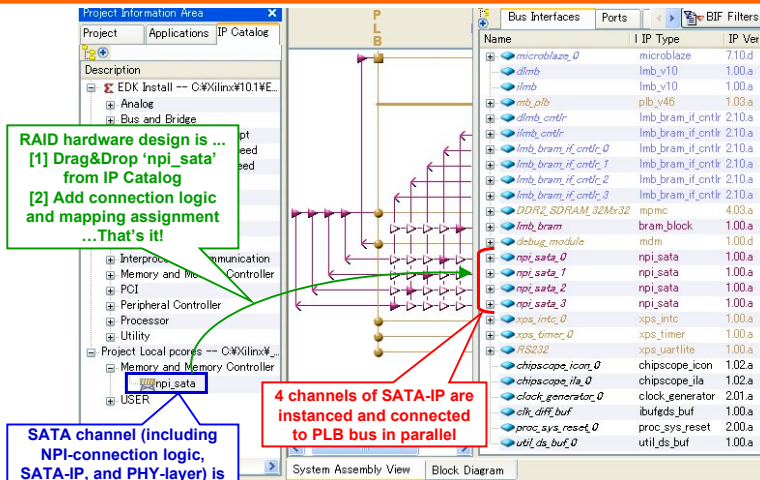
Page 4

# Block Diagram



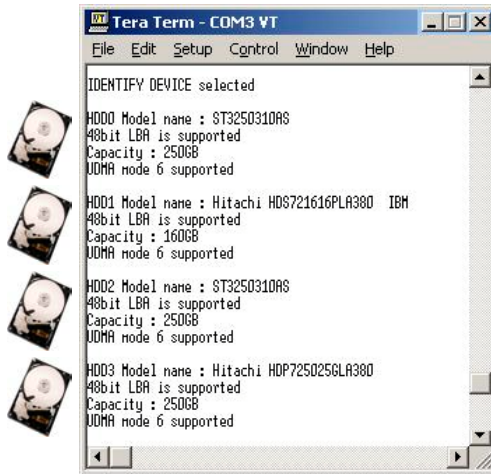
**RAID prototype system block diagram**

# EDK Project



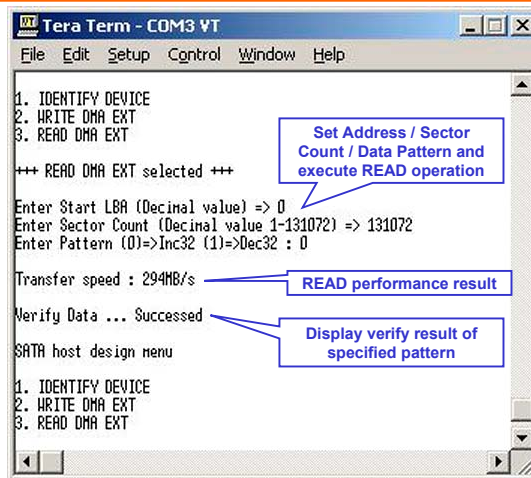
**EDK (PlatformStudio) Project**

## Connected HDD



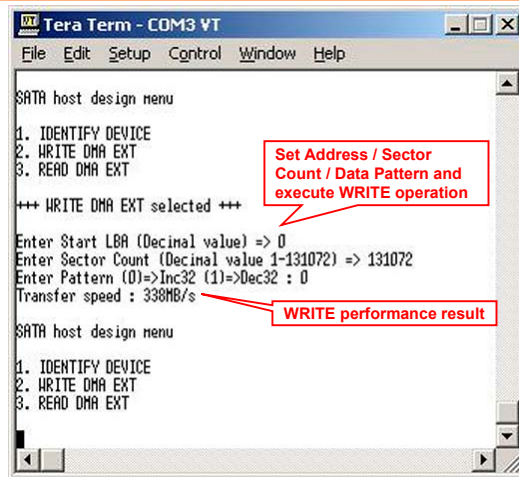
**Connected HDD information of IDENTIFY data**

## Read Result



**131,072 sector (64MB) READ result**

# Write Result



**131,072 sector (64MB) WRITE result**

# RAID Performance

HDD#	Connected HDD	Read speed [MB/s]	Write speed [MB/s]
HDD0	ST3250310AS	104	106
HDD1	HDS721616PLA380	75	78
HDD2	ST3250310AS	104	106
HDD3	HDP725025GLA380	87	93
Sum of individual HDD speed		370	383
Measured RAID speed		294	338
RAID speed efficiency [%]		79.5	88.3

Speed performance of each individual HDD

RAID speed efficiency rate against sum of each HDD speed

- **Read speed efficiency rate of RAID system = 79.5%.**
  - System is not optimized yet because Almost-Full flag is not available at the FIFO of MPMC.
  - Further speed improvement is possible by data flow optimization.
- **Write speed efficiency rate of RAID system = 88.3%.**
  - Result of software RAID controller by MicroBlaze.
  - Further speed improvement is possible by hardware controller.

# Conclusion

- **ML555+adapter board enables RAID prototype system.**
  - Quick check of RAID system without new board building.
- **RAID performance is 80-90% of individual HDD total.**
  - Further improvement is possible by system optimization.
- **This prototype design is available for SATA-IP users.**
  - Reduce RAID system development period based on this design.



2009/06/22

Design Gateway

Page 11

# For more detail

- **Detailed technical information available on the web site.**
  - <http://www.dgway.com/products/IP/SATA-IP-E.html>
- **Contact**
  - Design Gateway Co., Ltd.
  - E-mail : [sales@design-gateway.com](mailto:sales@design-gateway.com)
  - FAX : +66-2-261-2290



### Features of SerialATA-IPcore

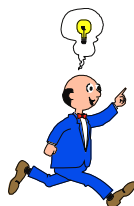
- Compliant with the Serial ATA specification revision 3.0 and next on class 10/15/30 device
- The Phone provides full feature Design Gateway provide transport layer and 20k/4/100kfile
- Full-speed I/O physical layer design for 300kps SATA-3 interface on reference design. It can connect with SATA-3 HDD without PHY chip (On-chip hardware/Software/Device)

### Block diagram of SerialATA-IPcore



### Document download

Document name	File name
<a href="#">SerialATA-Phone Datasheet</a>	<a href="#">SA_sata_3_data_sheet.pdf</a>
<a href="#">SerialATA-Phone Block Reference Design Document</a>	<a href="#">SA_sata_3_block_ref.pdf</a>
<a href="#">SerialATA-IPcore Reference Design Document</a>	<a href="#">SA_sata_3_ref_design_block.pdf</a>



2009/06/22

Design Gateway

Page 12