

SATA-IP RAIDx4 reference design on 7-Series and KCU105

Rev2.0 22-Jan-16

1. Introduction

Before starting RAID0 demo, it is recommended for user to read the details of one channel host demo reference design from “dg_sata_ip_refdesign_host_7series_en” document to understand SATA-IP and system environment firstly. In this document, it will describe only the additional part to extend SATA port from one channel to 4 channels and run RAID0 operation.

2. Environment

To run RAID0 reference design, please prepare following environment as shown in Figure 2-1.

- KC705/ZC706/VC707/VC709/KCU105 board
- Vivado/ISE for programming bit file
- FMC SATA RAID board, provided by Design Gateway
- 4 SATA-III Device (HDD/SSD) connecting to SATA connector on FMC SATA RAID board
- USB Micro-B cable for FPGA configuration
- USB Mini-B/Micro-B cable for serial communication. For serial communication, set baud rate=115,200 / data=8bit / Non-Parity / Stop=1bit.

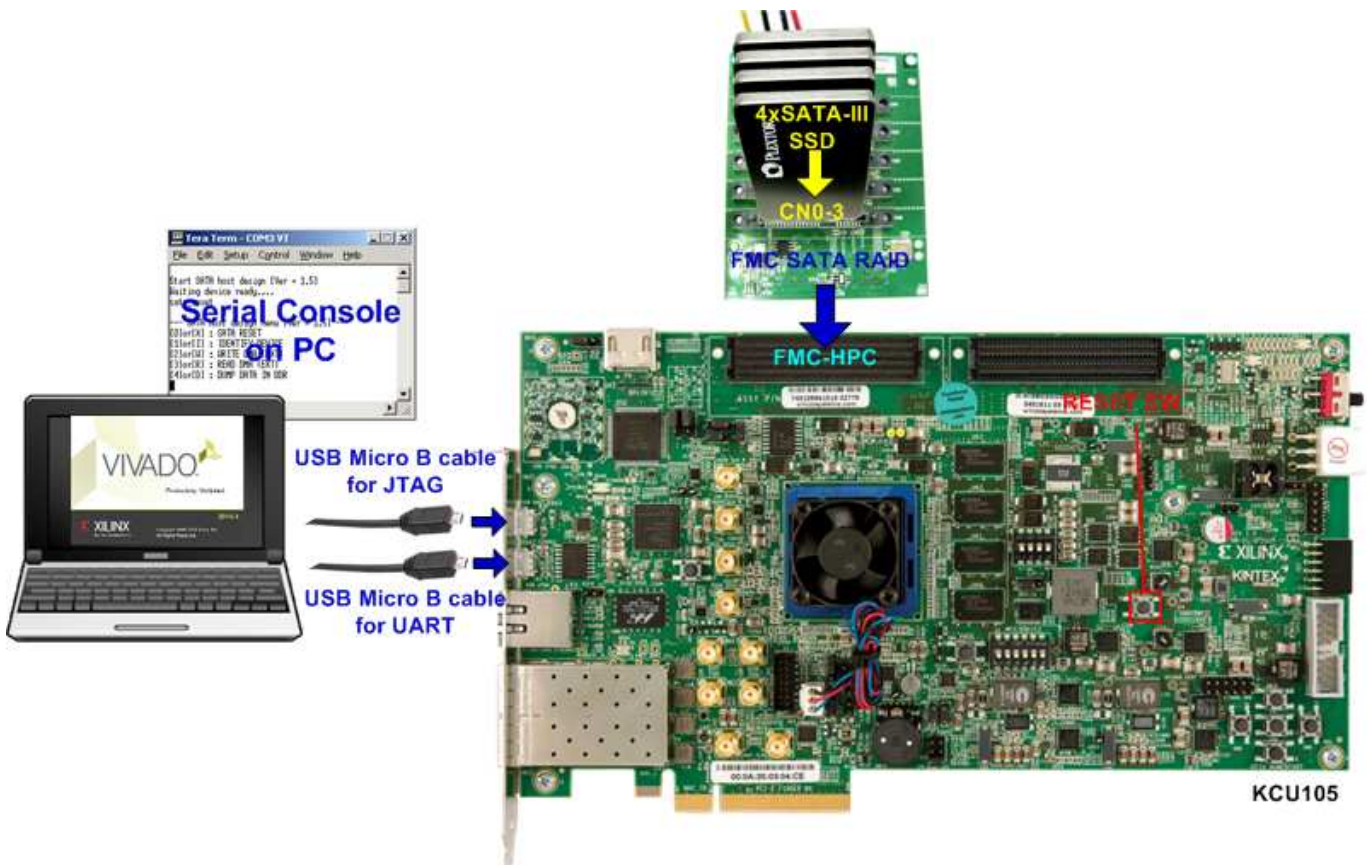


Figure 2-1 Reference design environment

The details to show how to run the demo step-by-step are described in “SATA-IP RAIDx4 Demo Instruction on 7-Series and KCU105” document.

3. Hardware description

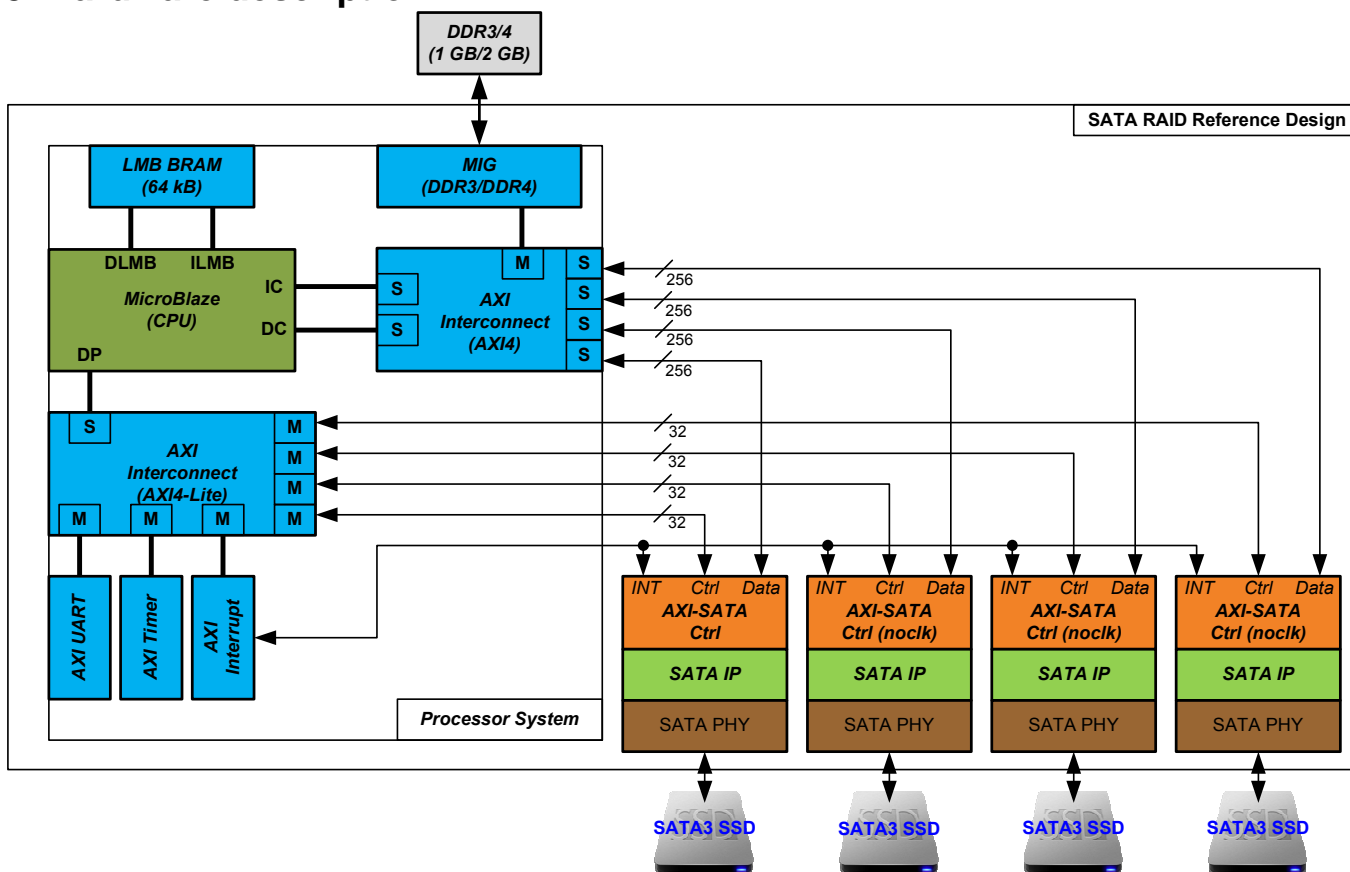


Figure 3-1 RAIDx4 reference design block diagram on FPGA board except ZC706

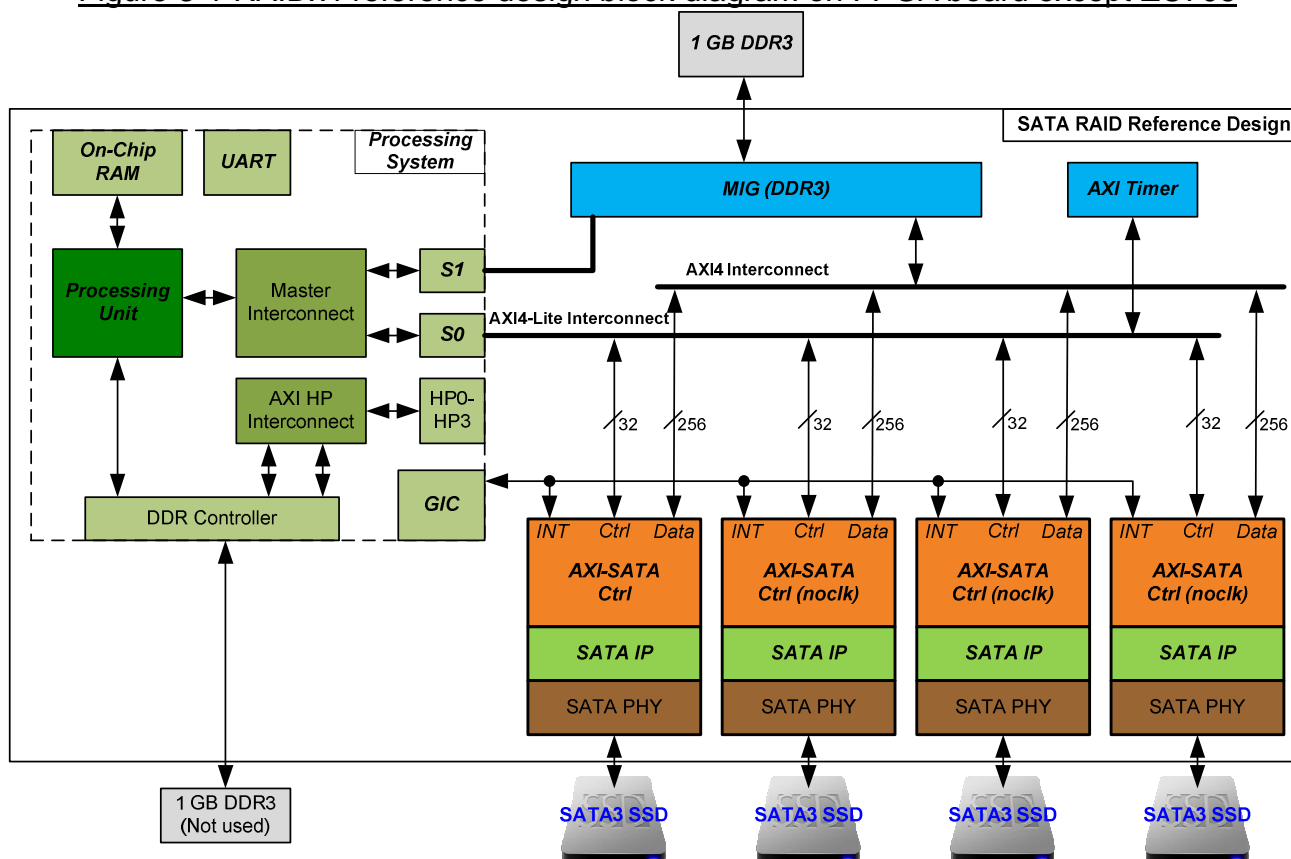


Figure 3-2 RAIDx4 reference design block diagram on ZC706 board

4. Software description

Basic operation of RAID0 demo is same as 1-ch host demo. Three SATA commands are selected to implement in the demo, i.e. IDENTIFY DEVICE, WRITE DMA (EXT), and READ DMA (EXT). To start any command operation, processor firmware sends the same command to all SATA devices. So, address and transfer length of each command for all SATA devices will be set to same value. After sending command completely, each SATA channel will be controlled through interrupt service routine which is assigned to different function to separate the operation of each SATA device. Data in demo is arranged to RAID0 format by processor firmware in data preparation and verification function. Data area within DDR for each SATA device will be arranged in contiguous area.

Figure 4-1 shows reference design operation result on serial terminal screen.

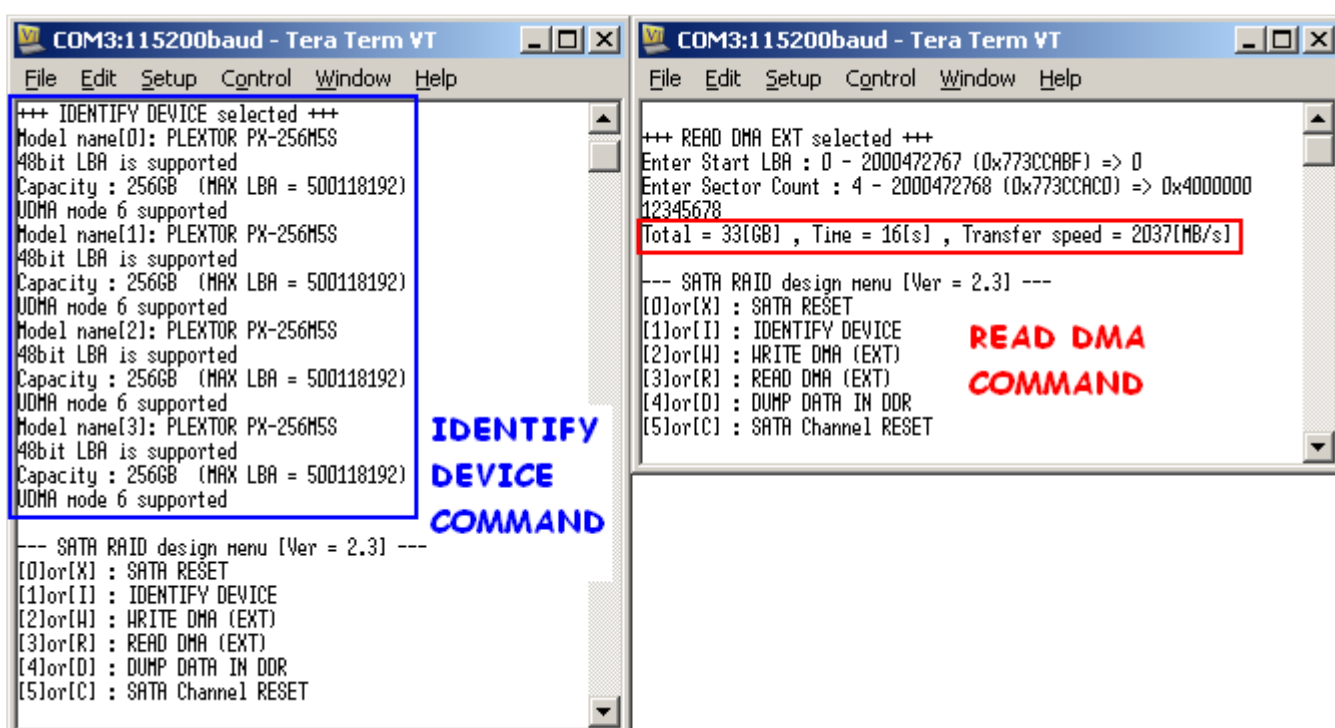


Figure 4-1 Operation result sample screen

5. Revision History

Revision	Date	Description
1.0	02-May-14	Initial release
2.0	22-Jun-16	Support 7-series and KCU105 board

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