Product Brief

IPA-SA149-BR

SATA 6Gb/s 1:2 High Capacity Bridge

Overview

The IPA-SA149-BR “HydraLP” is an integrated circuit that increases the amount of storage and improves performance by aggregating 2 SATA drives into one and presents these multiple physical SATA storage devices as a single logical unit to the host. “HydraLP” based volumes are capable of reaching 2X the capacity of a single drive and with Native Command Queuing support (NCQ), very high performance is achieved in both read and write modes maximizing IOPS and throughput.

The “HydraLP” hardware design requires no firmware intervention for read or write I/Os and introduces very little latency to issue commands and transfer data between the host and SATA storage devices. An on-chip CPU is available for issuing and handling SMART, TRIM and vendor specific commands to ensure that volumes built with Flash based SSDs maintain optimum performance levels.

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Features

- Supports 2 drives; cascadable for higher drive count
- Supports SATA 6Gb/s, 3Gb/s and 1.5Gb/s speeds
- Hardware only; no firmware intervention required for read or write I/Os
- NCQ command support
- DSM support – TRIM Commands
- SMART command support
- Spread spectrum clocking support
- Embedded processor
- Achieves scalable performance and capacity with the number of drives
- Supports data striping for maximum performance
- Power mode support (DIPM/HIPM)
- Supports all standard host O/S drivers
- Industrial temp range (Tj): -40º to +100º C

Reference/Evaluation Board

Applications

- SSD manufacturers with a need to build larger drives using smaller capacity drives
- Applications requiring high bandwidth and IOPS
- Applications requiring continued SMART monitoring
- Host systems with High Performance requirements

Performance

- Saturates SATA 6Gb/s available bandwidth
- > 500MB/s Read/Write
- > 90K IOPS 4K Read/Write

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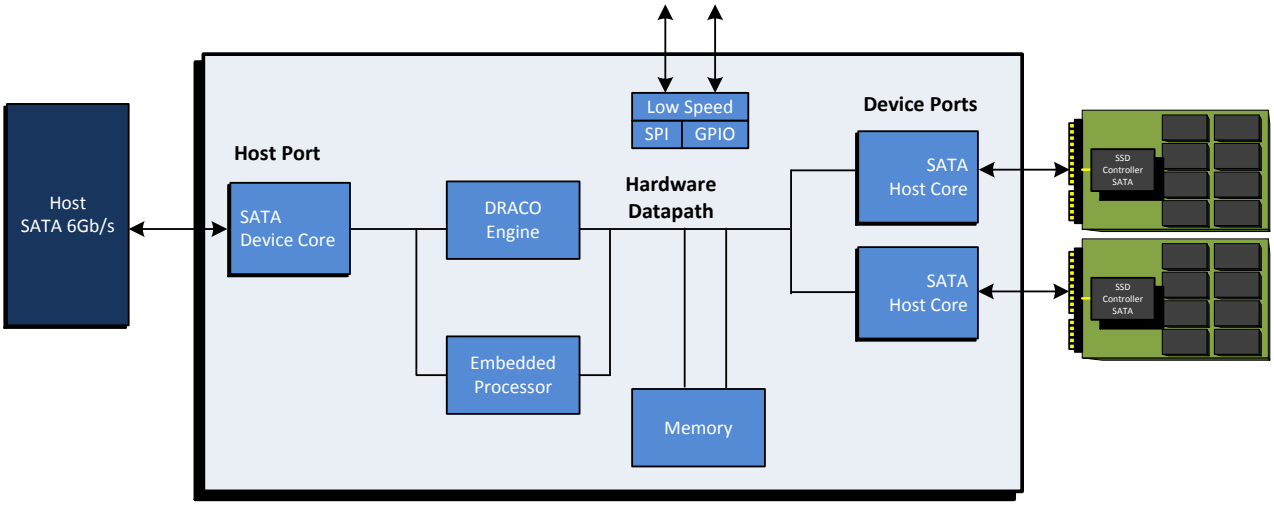


IPA-SA149-BR Block Diagram

"HydraLP" Architectural Overview

The hierarchy of the "HydraLP" design can be divided into 4 main blocks:

- SATA Host Cores
- SATA Device Core
- DRACO Data Engine
- Processor and Memory

The SATA interface to each drive is implemented with the IntelliProp SATA core configured as a SATA host. The PC connection is accomplished via the IntelliProp SATA Device core. The "HydraLP" Bridge supports SATA 6.0Gb/s (host) / 3.0Gb/s (drive); or SATA 3.0Gb/s (host) / 1.5Gb/s (drive).

The DRACO Engine consists of an LBA translator, a data router, and the DRACO State Machine. The LBA translator converts incoming requests to the appropriate LBA's to each drive. Additionally, for each drive connection, there is an ATA Host State Machine and a DATA FIFO. No additional software or drivers are required.

The system processor allows for individual non data command processing including DSM/TRIM support, SMART commands, and system configurable features.

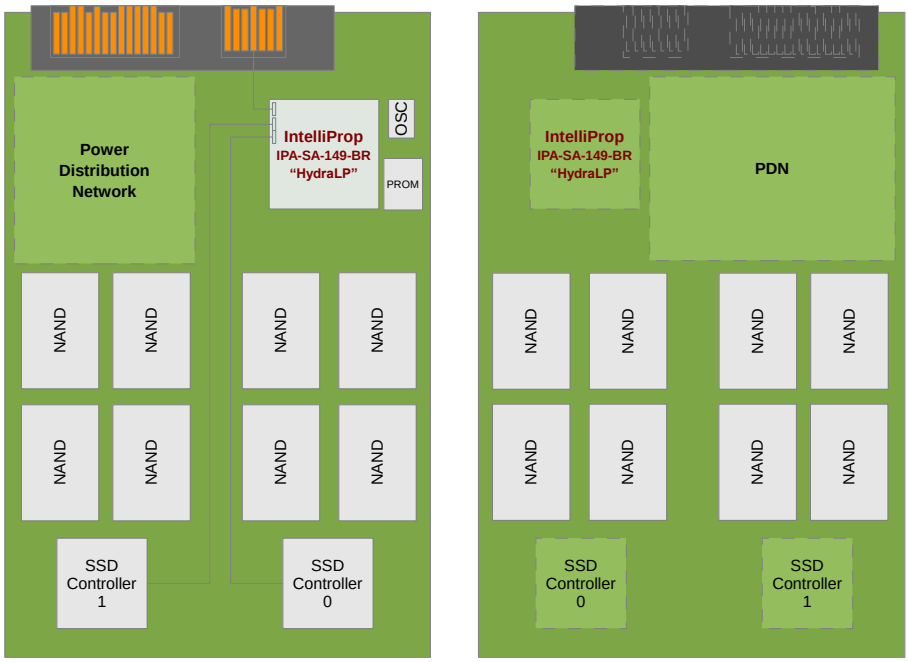
"HydraLP" architecture supports software customization, quoted upon request.

IntelliProp Advantage

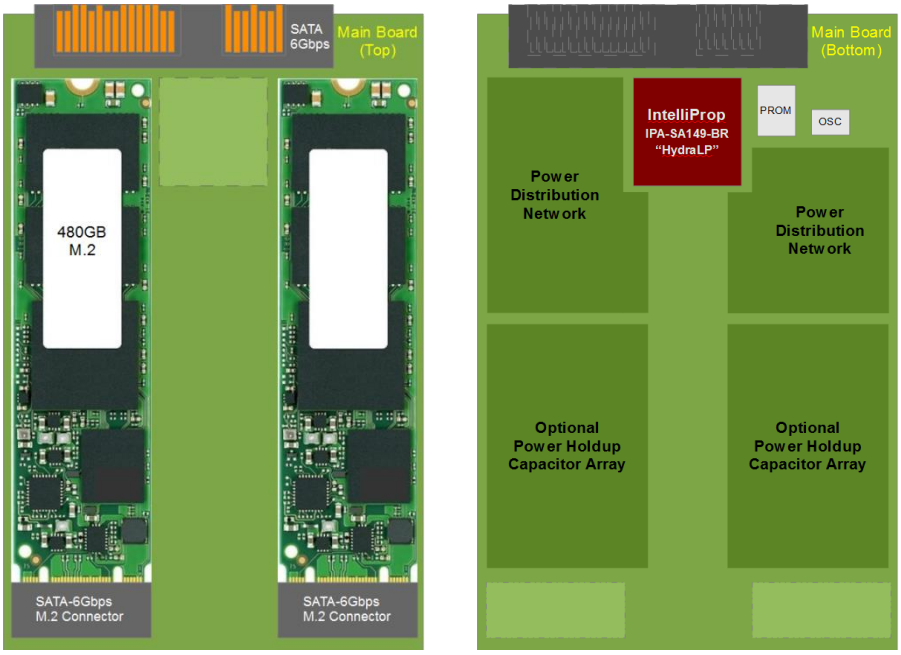
IntelliProp provides tools to help you bring your product up quickly and to minimize first pass design issues. IntelliProp will provide the following: "HydraLP" implementation guide; "HydraLP" reference design with schematics, board layout files, BOM and "bring-up" programming files.

Example Configurations

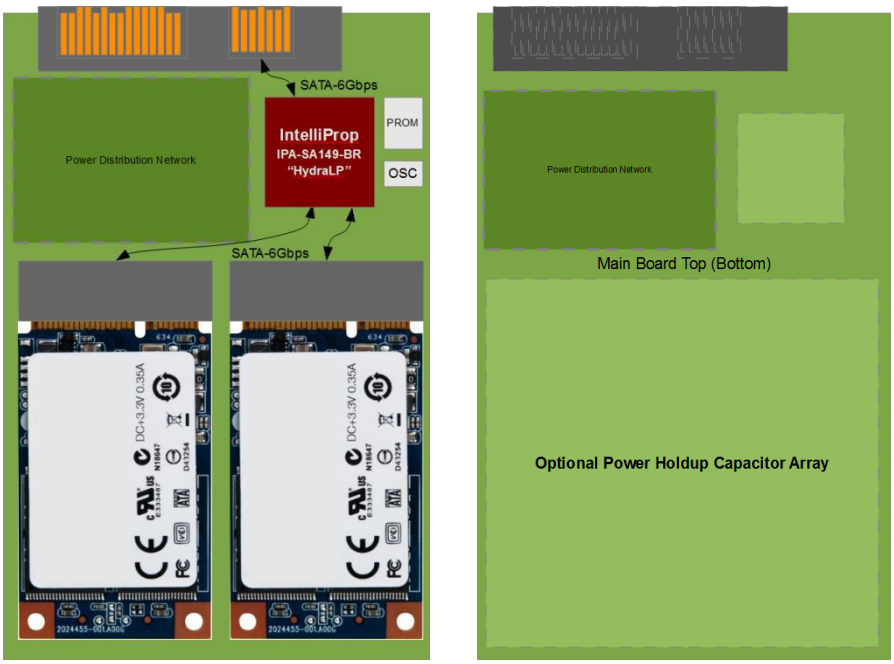
Example 1: 1TB 2.5” drive (512Gbit NAND)



Example 2: 1TB 2.5” drive using 2 M.2 drives (500GB drives)



Example 3: 1TB 2.5” drive using 2 mSATA drives (500GB drives)



Physical and Environmental

Package: 17mm x 17mm UBGA (Ultra FineLine Ball-Grid Array), 0.8mm BSC
Industrial Temp Operating Range (T_j): -40º to +100º C

Order Part Number

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