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ProcStarIVボードは、Stratix IV-E530,E820 および Stratix III-80E,110E の4種類のFPGAから1種類を1、2、4個の３種類の個数で実装でき、合計12種類のボードがあります。

think SPEED think GiDEL™

Product Brief
November 2010

ProcStarIV™

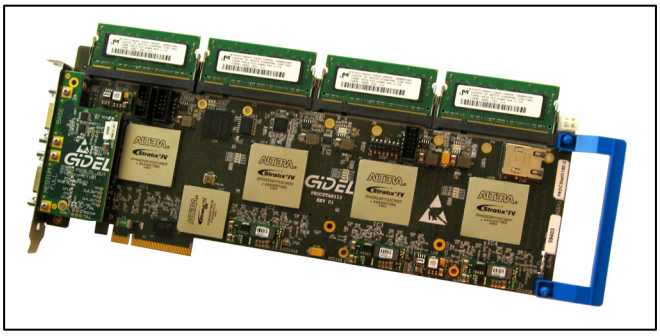
PCIe x8 Computation Accelerator

Key Features

- Up to 4 Stratix IV E530/E820 or Stratix III 80E/110E FPGAs
- 8-lane PCI Express (PCIe x8) host interface
- Five level memory structure (**34GB**+).
  Maximum sustain throughput of **18,770 GB/s** to internal memories and **48 GB/s** to DRAMs as follows:
  - ✓ Up to 6440 M9K (9K-bit) DPRAM blocks (**17,388 GB/s** throughput @ 300Mhz)
  - ✓ Up to 240 M144K (144K-bit) RAM blocks (**1,382 GB/s** throughput @ 300Mhz)
  - ✓ Up to 65,050 MLAB (640-bit) RAM blocks
  - ✓ Up to 4 large 512MB DDR2 memories with **16GB/s** sustain throughput using up to 24 ports. (Up to 64 ports with lower access rate)
  - ✓ 8 DDR2 SODIMMs with up to **4GB** each at a maximum sustain throughput of **32 GB/s** using up to 64 ports.
- Supports 5 ProcStar IV Daughter Boards (PSDB): SDI, DVI, Camera Link, PHY II and other interfaces
- Typical system frequencies: 100-325 MHz.
- Flexible clocking system.
- Volatile and non volatile design security
- Reference design for fast direct board to board connection via SODIMM sockets.
- Supported by GiDEL's ***Proc Developer's Kits***.

Benefits

- Leading edge performance
- Maximum flexibility to fit customer needs
- Cuts development cycle time and budget
- Maintainability
- Reliability
- Long life cycle



ProcStarIV Board with one Daughter board and 4×SODIMMs

Overview

The ***ProcStarIV***™ system provides a high-capacity, high-speed FPGA-based platform fortified with high throughput and massive memory resulting in a powerful and highly flexible system. The ***ProcStarIV*** can be hosted via 8-lane PCI Express. The performance, memory and add-on daughter boards' flexible architecture enable the system to meet almost any computation needs. In addition to 2 GB on-board memory, eight SODIMM sockets provide up to 32 GB of memory or additional connectivity and logic. Abundant memory conjoined with fast PCIe connection enable strong co-processing between a standard PC operating system and the FPGA acceleration.

The ***ProcStarIV*** system, with GiDEL's ***ProcDeveloper's Kit*** and tools, offers an incredible performance yet supports quick implementation of your unique design. This is achieved by eliminating the need for a high-speed board design, a PCI Express application driver, board constraints and environment FPGA code. The generated HDL code enables high throughput, easy-to-use parallel access to large memories. As a result, designers can focus on their proprietary value-added design. User designs may be in HDL, C-based, Simulink (graphical design) or any combination of them.

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Target Applications

- COTS acquisition and accelerator boards in:
  - ✓ HPC (High Performance Computing)
  - ✓ Machine Vision and Imaging
  - ✓ High performance acquisition systems
  - ✓ Bioinformatics Applications
- Small ASIC and SoC Prototyping
- Complex algorithm and IPs validation.

Development Environment

The ***ProcDeveloper's Kit,*** GiDEL's intuitive design and debug environment, facilitates design development effort on the ***ProcStarIV*** system. The kit contains ***ProcWizard***™, ***ProcMultiPort***™ IPs, ***Quartus*** and ***USBBlaster,*** and a ***ProcHIL***™ option.

The ***ProcWizard*** performs hardware initialization and automatically generates the following:

- Interface documentation in HTML or Microsoft Word
- C++ class(es) application driver(s) enabling simultaneous accesses of multiple applications, each to its' dedicated section of the Proc board.
- Top-level designs, interface modules / entities and on-board memory controllers for the application use.
- Device constraints (as pin-outs).

The ***ProcMultiPort*** core IPs provides simple access as FIFOs and frame delays to the on-board DRAM. It enables parallel access to the on-board memory while enabling to split the physical memory into multiple logical memories.

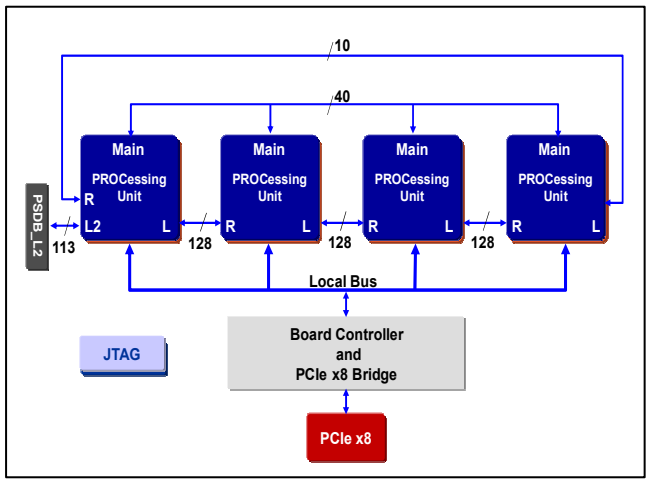
As a result the main benefits are:

- Simplifies design and enhances system performance
- Replaces the need for inventory of special memories by using standard memory and IP

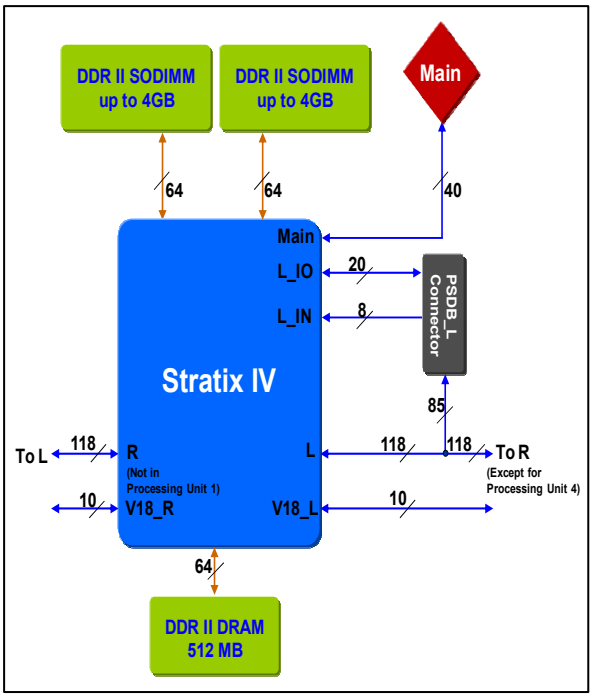
The ***USBBlaster*** provides visibility to internal signals using the available FPGA memory.

The ***ProcHILs***™ enables to accelerate tremendously ***Simulink***™ design simulations from within the Simulink environment by implementing Hardware-in-the-Loop simulation on the ***ProceIV*** board. Alternatively, the ***ProcHILs*** may be used, via Simulink, as a design entry tool for an FPGA based accelerator.

Other high-level design entry options, such as C++, are available via GiDEL's partners.



ProcStarIV Board Diagram



Processing Unit (FPGA, memories & connections)

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