

H100 Series

FPGA Application Accelerators

Products in the H100 Series

PCI-X Mainstream



H101-PCIXM

- » HPC solution for optimal price/performance
- » PCI-X form factor
- » Single Xilinx® Virtex 4 FPGA processor
- » SRAM and SDRAM external memory
- » Four high-speed serial I/O system links
- » Supported by Nallatech's application development flow and ANSI C-to-FPGA compiler
- » Ideal for adding FPGA compute capability to new or existing clusters

6.4

DOUBLE PRECISION
GFLOPS SUSTAINED

20

SINGLE PRECISION
GFLOPS SUSTAINED

64

INT16 GigaOPS
SUSTAINED

IBM® EBlade



H102-EBLADE

- » IBM® BladeCenter® expansion blade
- » Two Xilinx® Virtex 4 FPGA processors
- » SRAM and SDRAM external memory
- » Eight high-speed serial I/O system links
- » Supported by Nallatech's application development flow and ANSI C-to-FPGA compiler
- » Ideal for adding FPGA compute capability to IBM® BladeCenter® clusters

12.8

DOUBLE PRECISION
GFLOPS SUSTAINED

40

SINGLE PRECISION
GFLOPS SUSTAINED

128

INT16 GigaOPS
SUSTAINED

IBM® BladeCenter®



H102-BLADECENTER

- » IBM® HS21 BladeCenter®
- » Single FPGA expansion blade with two Xilinx® Virtex 4 FPGA processors
- » Eight high-speed serial I/O system links
- » Supported by Nallatech's application development flow and ANSI C-to-FPGA compiler
- » The ideal platform for adding FPGA compute capability to IBM® BladeCenter® clusters

12.8

DOUBLE PRECISION
GFLOPS SUSTAINED

40

SINGLE PRECISION
GFLOPS SUSTAINED

128

INT16 GigaOPS
SUSTAINED

IBM® BladeCenter®



H114-BLADECENTER

- » Fully loaded IBM® HS21 BladeCenter®
- » Seven FPGA expansion blades each with two Xilinx® Virtex 4 FPGA processors
- » Fifty-six high-speed serial I/O system links
- » Supported by Nallatech's application development flow and ANSI C-to-FPGA compiler
- » The ideal platform for adding FPGA compute capability to IBM® BladeCenter® clusters

89.6

DOUBLE PRECISION
GFLOPS SUSTAINED

280

SINGLE PRECISION
GFLOPS SUSTAINED

896

INT16 GigaOPS
SUSTAINED

H100 Series

FPGA Application Accelerators

Technical Specification

	H101-PCIXM	H102-EBLADE	H102-BLADECENTER	H114-BLADECENTER
FPGA Compute Engine				
Total number of FPGA Processors	1	2	2	14
Xilinx FPGA Type	Virtex-4 LX100	Virtex-4 LX100	Virtex-4 LX100	Virtex-4 LX100
Internal Memory per FPGA processor	0.5 MBytes RAM distributed across FPGA, 0.5 TBytes/sec bandwidth	0.5 MBytes RAM distributed across FPGA, 0.5 TBytes/sec bandwidth	0.5 MBytes RAM distributed across FPGA, 0.5 TBytes/sec bandwidth	0.5 MBytes RAM distributed across FPGA, 0.5 TBytes/sec bandwidth
External SRAM per FPGA processor	16 MBytes DDR-II SRAM across 4 banks, 6.4GBytes/sec total bandwidth	16 MBytes DDR-II SRAM across 4 banks, 6.4GBytes/sec total bandwidth	16 MBytes DDR-II SRAM across 4 banks, 6.4GBytes/sec total bandwidth	16 MBytes DDR-II SRAM across 4 banks, 6.4GBytes/sec total bandwidth
External SDRAM per FPGA processor	512 MBytes DDR2 SDRAM in 1 bank, 3.2GBytes/sec bandwidth	512 MBytes DDR2 SDRAM in 1 bank, 3.2GBytes/sec bandwidth	512 MBytes DDR2 SDRAM in 1 bank, 3.2GBytes/sec bandwidth	512 MBytes DDR2 SDRAM in 1 bank, 3.2GBytes/sec bandwidth
Max # double precision FPU's	32	64	64	448
Max # single precision FPU's	100	200	200	1,400
Max # INT16 Units	320	640	640	4,480
FPGA clock frequency	200MHz	200MHz	200MHz	200MHz
Inter compute engine serial comms	4x 2.5 Gbit/sec serial links	8x 2.5 Gbit/sec serial links	16x 2.5 Gbit/sec serial links	56x 2.5 Gbit/sec serial links
Serial comms latency	340ns	340ns	340ns	340ns
System Performance				
Double Precision Floating Point	6.4 GigaFLOPS	12.8 GigaFLOPS	12.8 GigaFLOPS	89.6 GigaFLOPS
Single Precision Floating Point	20 GigaFLOPS	40 GigaFLOPS	40 GigaFLOPS	280 GigaFLOPS
Integer 16	64 GigaOPS	128 GigaOPS	128 GigaOPS	896 GigaOPS
Actual performance is dependant on the end application and the extent to which the algorithms can be pipelined or parallelized.				
Power Consumption				
Total Power Consumption (typical)	25W	50W	150W	500W
Development Tools Support				
Supported Compilers	DIME-C Impulse-C Mitronics Mittrion-C	DIME-C Impulse-C Mitronics Mittrion-C	DIME-C Impulse-C Mitronics Mittrion-C	DIME-C Impulse-C Mitronics Mittrion-C
Host Configuration				
HS21 Blades	Not Applicable	Not Applicable	Intel Xeon Processor 5110 (1.60GHz, 1066MHz) 2x2MB L2 Cache, Dual Core*	Intel Xeon Processor 5110 (1.60GHz, 1066MHz) 2x2MB L2 Cache, Dual Core*

Ordering Information

H101 PCI-X Mainstream	H101-PCIXM
H102 BladeCenter expansion blade	H102-EBLADE
H102 BladeCenter Solution: IBM BladeCenter Chassis, H102 blade	H102-BLADECENTER
H114 BladeCenter Solution: IBM BladeCenter Chassis, 7 H102 blades	H114-BLADECENTER
H1XX BladeCenter Solution: IBM BladeCenter Chassis with choice of 4, 6, 8, 10 or 12 FPGAs	H1XX-BLADECENTER (replace XX with the number of FPGAs: 04, 06, 08, 10 or 12)
Nallatech HPC Software Toolkit	H100-DEVKIT-S

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