

AMI Semiconductor

## XPressArray®-II 0.15µm Structured ASIC

### Key Features

- Next-generation 0.15µm structured ASIC platform for high-performance 1.5V ASICs and FPGA-to-ASIC conversions
- NRE and production cost savings
- Significant time-to-market advantages
- Drop-in replacement for cost-reducing Xilinx® Virtex™-II and Virtex-II Pro and Altera® APEX-II and Stratix designs
- 511K to 4.8M ASIC gates
- 210MHz system, 500MHz local clock speeds
- Low power consumption
  - 0.055µW/MHz/gate @ 1.575V
- 258Kbits to 4.8Mbits of block RAM memory
- 18Kbit initializable dual-port RAM blocks at speeds up to 330MHz
- Up to 6.1Mbits of memory when 50 percent of the logic sites are used for distributed memory
- Initializable distributed memory at speeds up to 210MHz
- Flexible I/O technology, any I/O standard assigned to any I/O pin
- Configurable signal, core and I/O power supply pin locations
- Supports LVTTTL, LVCMOS, PCI33, PCI66, PCI-X 133, PCI-X 2.0, GTL+, HSTL class 1, 2, 3, and 4, SSTL2 class 1 and 2, LVPECL (input), and LVDS I/O standards
- 1.5V, 1.8V, 2.5V, and 3.3V capable I/O
- True 3.3V tolerance with no external resistor necessary
- Digital controlled impedance (DCI)
- Built-in dual data rate (DDR) support
- LVDS data rates to 1Gbps
- Up to 1360 user I/Os
- Comprehensive clock management circuitry
- Up to eight delay-locked loops (DLLs) and eight phase-locked loops (PLLs)
- Variety of package options
- Integrated high-fault coverage scan-test, memory BIST and JTAG



### Product Description

Targeted at medium-density, high-speed, 1.5V ASIC applications and high-density FPGA-to-ASIC conversions, the XPressArray-II (XPA-II) 0.15µm structured ASIC is an innovative next-generation technology platform that reduces time-to-market for system-on-chip (SoC) applications while delivering significant NRE and unit cost savings.

XPA-II offers a true drop-in replacement for Xilinx Virtex-II and Virtex-II Pro and Altera APEX-II and Stratix FPGAs, making it the industry's lowest cost ASIC conversion solution. The result is a simplified route to cost reductions for OEMs looking to combine the flexibility of FPGA prototyping with a path to ASICs for final production.

Operating with system clock speeds up to 210MHz for 18x18 soft multipliers and local clocks up to 500MHz and available in a variety of package options, XPA-II 0.15µm devices deliver high-performance, low power ASIC solutions with densities to 4.8M ASIC gates.

Configurable memory ranges from 258Kbits to 4.8Mbits, which increases up to 6.1Mbits of memory with the addition of distributed configurable memory, assuming 50 percent of the logic sites are used for memory.

Flexible I/O technology includes support for a comprehensive array of common standards and compatibility with 1.5V, 1.8V, 2.5V, and 3.3V I/O

## Product Description continued

schemes. I/Os support DCI on-chip termination. DDR support for high-speed memory interface is built-in. High fault coverage is provided through integrated scan-test, memory BIST and JTAG support.

For FPGA conversions, rapid access to XPressArray (XPA) technology can be achieved via AMI Semiconductor's NETTRANS® FPGA-to-ASIC design flow. Alternatively, the

availability of XPA synthesis libraries for leading commercial synthesizers allows conversion of FPGA designs to ASICs by simply re-targeting from an FPGA library to an XPA library.

For a data sheet with complete technical specifications, please visit AMI Semiconductor's Technical Resources at [www.amis.com](http://www.amis.com).

## Technology

XPA-II technology is ideal for medium density ASIC applications requiring high performance and low power, with 1.5V operation. XPA-II devices are fabricated using a hybrid technology that integrates an established 0.15µm front-end process with a proven AMIS metal finishing technology, which is used to produce a customized back-end. The 0.15µm processing steps are common to multiple applications, reducing costs by allowing existing tooling to be utilized. At the same time, tooling and manufacturing costs are significantly lower for the metal finishing process than for traditional 0.15µm cell-based processes. The result is that XPA-II delivers reduced cycle times and significant reductions in terms of both NRE and unit cost through manufacturing utilizing structured ASIC technology.

There are nine bases in the AMIS XPA-II family. These bases offer between 511K and 4.8M gates and up to 4.8Mbits of block RAM. RAM may be configured as single or dual port with

asymmetrical port widths. The architecture also supports RAM initialization. Flexible I/O technology includes fully configurable core and I/O power supply pads and support for one of the industry's widest ranges of I/O standards including LVTTTL, LVCMOS, PCI33, PCI66, PCI-X 133, PCI-X 2.0, GTL/+, HSTL class 1, 2, 3, and 4, SSTL2 class 1 and 2, LVPECL input, and LVDS. Comprehensive clock management circuitry features up to eight all digital DLLs and a maximum of eight PLLs.

Compared to equivalent FPGAs operating at the same voltage levels, XPA-II devices offer higher densities, better performance and lower power consumption. Low power consumption further contributes to cost savings as lower cost plastic packaging can be used in many cases. XPA-II products are designed for pin-for-pin replacement of Xilinx and Altera FPGAs and offer integration of multiple FPGAs into one ASIC. Package options include a wide range of Flip Chip BGAs in 1.00mm and 1.27mm pitches.

XPA-II Base	User I/Os	DLLs	PLLs	No Distributed RAM			50% Distributed RAM	
				18K Memory Blocks	Memory Bits (K) <sup>1</sup>	Logic Gates (K) <sup>2</sup>	Memory Bits (K) <sup>1</sup>	Logic Gates (K) <sup>2</sup>
X2P360	360	2	4	14	258	511	389	256
X2P560	560	4	4	40	737	912	972	456
X2P640	640	4	4	48	884	1219	1198	609
X2P720	720	4	4	57	1056	1589	1459	725
X2P846	846	4	4	101	1862	1854	2338	927
X2P880	880	4	4	101	1862	2127	2408	1063
X2P1040	1040	4	4	145	2673	2889	3414	1445
X2P1200	1200	8	8	189	3484	4085	4532	2042
X2P1360	1360	8	8	264	4866	4868	6116	2434

(1) Usable 2RW RAM bits

(2) Usable 2-NAND equivalent logic gates