Xilinx Delivers Lower Cost While Continuing to Redefine Programmable Logic

Xilinx is the leader in both low-cost and high-performance programmable logic.

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Since we invented the FPGA in 1988, we have aggressively advanced our technology in many ways. You are probably familiar with the extreme performance and the advanced features of our Virtex™ family. However, you may not be aware that our technology advances have also allowed us to develop very low cost devices, processes, and features that save you a significant amount of money.

Our commitment to lowering your costs has opened many new, high-volume applications for our products. Our FPGAs and CPLDs are now used in a wide range of low-cost, high-volume applications, from cell phones and digital cameras, to automobiles and DVD players. So, as you can see, while we have redefined the standards for programmable logic with major advances in performance, features, speed, density, power, flexibility, tools, and cores, we have also set new standards for cost effectiveness. As the industry's technology leader, our customers have come to expect these kinds of advances from Xilinx.

Programmable Logic Costs Less

Xilinx programmable logic solutions offer many unique cost advantages over competing technologies. When you look at the total cost of creating and manufacturing your products, you'll see that device cost alone is not the only factor. Some of the cost advantages of programmable logic include:

- **Ease of use.** There simply is no easier way to develop digital products. Our software tools are fully optimized for our devices, which reduces your risks and helps you create better designs that run faster, with fewer engineers – saving you a significant amount of money.

- **Faster development time.** Time to market is a critical factor in the profitability of most products. The sooner you get your product manufactured, the more money you make. There is no faster way to get from idea to finished product – significantly increasing your profitability.

- **Field reprogrammability**. Time in market is another key factor in profitability; the longer your product stays viable, the more money you make. Our programmable logic devices can easily be reprogrammed, in the field, over the Internet. You can fix bugs, add new features, or adapt to changing market trends with ease. This will make your customers happy, save you a lot of engineering time and expense, and give you a superior product – a unique and significant cost advantage.

- **Comprehensive support services.** The more you know, the more productive you can be. You significantly reduce your risks and your development problems when you fully understand the devices and tools you use; plus you can create more, faster. Our education and support services are the best in the industry, helping you do more – with far less cost.

As you can see, programmable logic technology – in general – is cost effective. However, we also strive to lower your specific device costs in every way we can, making our devices attractive in many new, low-cost applications.

Spartan-IIE FPGAs – Your Best Value for Today's Digital Consumer Applications

When we introduced the Spartan™-IIE family of cost-optimzed FPGAs in November 2001, we delivered the optimum combination of performance, flexibility, and value. Designed for today's cost-sensitive digital consumer applications, the Spartan-IIE family includes advanced features such as low voltage differential signaling (LVDS), high-speed dual-port block RAM, and digital delay-locked loops (DLLs), with up to 300,000 system gates of programmable logic. Supporting such popular IP cores as PCI interfaces and our MicroBlaze™ soft processor, these solutions are the ideal alternative to gate arrays in applications such as broadband access, set-top boxes, and plasma displays.

Spartan-IIE devices lower your costs even further because your can quickly develop your designs using our industry-leading ISE 5.1i software. Your time to market is significantly reduced because our comprehensive tools are fast, efficient, and thorough, making your job far easier than ever before. Plus we offer a wide selection of time saving cores, optimized for the Spartan architecture. Our cores and our new ISE 5.1i software help you complete your designs faster than ever before.

In high volume production applications, Spartan-IIE devices cost less than any competitive solution. You get an outstanding value because we integrate many of the expensive system functions normally found in standalone ASSP devices, plus we use advanced 300 mm wafer fabrication technology that reduces our manufacturing costs to the minimum. Spartan series solutions are the lowest cost FPGAs in the industry today.

When you add it all up, there is no faster, easier, or lower cost method for creating high volume designs that give you all the benefits of programmable logic.

CoolRunner-II RealDigital CPLDs – Redefine Low-Power Technology and Value

In January, 2002, we introduced the CoolRunner™-II family of RealDigital CPLDs. This family defined a new class of CPLDs, combining high performance, ultra-low power, and advanced system features with the most competitive prices in the industry. What makes these CPLDs unique is that we removed the traditional power-hungry analog sense amplifiers, replacing them with low-power digital CMOS circuitry. Now we can offer the best performance in the industry with standby power that is 100 times lower than any competing device. We also added many powerful system features normally associated with FPGAs, such as clock

management and multiple-voltage I/O capability. CoolRunner-II CPLDs are available in tiny, low-cost packages as well, which makes them ideal for any portable, battery-powered, high-volume application.

The all-digital technology used in CoolRunner-II devices also allows us to use the same process technology that we pioneered for our FPGAs, gaining economy of scale and leveraging the cost benefits of using the latest manufacturing technology. Thus, we can offer you the most competitive prices in the industry. Now you don't have to choose multiple CPLD solutions to get the best performance, power, features, or price – you get it all in our CoolRunner-II CPLDs.

Virtex-II Pro FPGAs – What Was Once Optional Is Now Standard

When we introduced the Virtex-II Pro FPGA family in March 2002, we delivered the industry's first platform for programmable systems. Because we embedded IBM PowerPC™ processor cores and 3.125 gigabit per second RocketIO™ serial transceivers into the industry leading Virtex-II programmable logic fabric, it is now possible for you to design a true programmable system on a single programmable device.

As with our other FPGAs and CPLDs, your Virtex designs are completed quickly in a comprehensive development environment that combines the highest performance silicon and software tools, the widest range of IP cores, and the most flexible system debugging environment in the industry.

Our overall mission is to deliver the most advanced technology in each new generation of devices, while driving down prices. We continue this strategy with the Virtex-II Pro family, which is not only opening the door to programmable system design in the future, it is also delivering more capability at lower cost for any user of programmable logic today.

Virtex-II EasyPath Solutions Reduce Cost While Minimizing Risk

To further reduce the costs of using our Virtex-II devices we developed a special testing program that can reduce device costs by as much as 80% in large volume applications.

Our new Virtex-II EasyPath™ devices use the same silicon as Virtex-II FPGA devices, but they are tested to your specific design image only, resulting in higher yields and significantly lower costs. This cost reduction approach is completely risk free. Your production devices will work exactly like your prototypes, because these devices are exactly the same as their general purpose cousins – the only difference is the testing.

Virtex-II EasyPath solutions give you a volume conversion strategy with no risk, no investment of your engineering resources, and the fastest conversion time of any competing high-volume strategy for high-density FPGA designs. This software-based approach to cost reduction has met with universal acclaim from our customers for its simplicity and effectiveness.

ISE 5.1i Software – Reducing Your Development and Production Costs

Our new ISE 5.1i software can save you money in a number of ways:

- **It's fast**. You can complete designs much faster than with any previous solution, and that's like putting money in the bank.

- **It's comprehensive**. Everything you need is provided, and it all works together in a seamless environment that makes your life easier.

- **It's easy to use**. The tools are well designed, thorough, and seamless. Plus we offer comprehensive training at your site, online, or at one of our training facilities.

- **It produces faster designs**. Because the software is optimized for the device architecture, your Virtex-II designs can run up to 15% faster than before. This means that you can often use a slower speed grade device, for a significant cost savings.

- **It's backed by XPERTS**. Xilinx XPERTS are people who are certified by Xilinx to have a deep knowledge of our software.

If you need an extra hand, or if you need to quickly solve design problems, Xilinx XPERTS will save you time and money.

ISE 5.1i

Tying all our new solutions together and offering cost savings of its own, our new ISE 5.1i software sets new standards for speed, productivity, and capability. The ISE tools now encompass logic design, embedded software design, and system design. Building on its position as the most widely used logic design system in the industry, the addition of new embedded design tools from Xilinx and key partners, such as Wind River Systems, make the ISE 5.1i tool set more powerful than ever, delivering cost savings as well.

For logic designers, being more productive and getting designs completed and debugged faster translates to lower develop-

ment cost. ISE 5.1i delivers this through improved incremental design capabilities, a powerful macro builder for design reuse, a graphical pinout and area constraints editor (PACE), and ChipScope™ Pro analyzers, the industry's most flexible and powerful system debugging solution.

ISE 5.1i also delivers production cost savings as well. Virtex-II designs will achieve system speeds an average of 15% higher than with our previous software. This translates into a lower speed grade requirement for production, and considerable cost savings over the life of a program. ISE 5.1i also includes architecture wizards that simplify integration of complex functions into the powerful digital clock managers (DCMs) and RocketIO serial transceivers in Virtex-II and Virtex-II Pro FPGAs. By integrating more functions into the FPGA, you can directly reduce the bill of materials cost in you systems.

If you are using the embedded PowerPC processors in our Virtex-II Pro FPGAs, you'll also need to develop embedded software. The ISE 5.1i embedded design tools, incorporating the industry-leading WindRiver Systems tools, make it easy for you to take full advantage of the powerful Virtex-II Pro platform for programmable systems.

Conclusion

Xilinx technology is not always expensive; in fact it will save you money in many ways. We offer the highest performance devices you can get, and that performance does come at a high price in the most advanced applications. However, we also offer a full range of high-performance devices that are well suited to low-cost applications as well. There are many reasons to choose programmable logic, and lower overall cost is one of best.