DRIVING INNOVATION WITH XILINX TARGETED DESIGN PLATFORMS
There’s never been a more dynamic time for electronic systems development. Economic realities dictate fewer resources, smaller budgets, and tighter schedules. Markets are fickle, and traditional customized system-on-chip options are limited to all but the highest-volume applications.

The Programmable Imperative is with us today because differentiation, innovation, and flexibility are converging like never before as the keys to succeeding in today’s environment. To keep pace, engineers need design methodologies that let them focus their valuable time on product differentiation and innovation.

In addressing the Programmable Imperative, Xilinx is making a two fold commitment to customers. The first is delivering programmable silicon innovations that supply industry-leading value in terms of price, power, performance, density, capabilities, and programmability. The second is to provide the people who build electronic systems with industry-leading tools, methodologies, IP, and support as they implement FPGAs into their systems.

**Enabling Design Differentiation and Success with Targeted Design Platforms**

Targeted Design Platforms enable you to satisfy the demand for ultra-high bandwidth serial connectivity in wired telecommunications or to build “green” wireless base stations. You can deliver dynamic, high-resolution video and audio for broadcast applications, or enhance the user experience for next-generation automotive infotainment. Use Xilinx FPGAs and Targeted Design Platforms to increase the picture quality of flat-panel displays, increase security through real-time image interpretation in video surveillance, meet size, weight, and power requirements for software-defined radios, and countless other applications.
The Foundation for Targeted Design Platforms

Xilinx Virtex®-6 and Spartan®-6 FPGA families are the programmable silicon foundation for Targeted Design Platforms. These new devices offer dramatic improvements in performance, power consumption, and cost reduction. Compared with previous generations, the two new families leverage advanced process technologies to:

- Reduce system cost by up to 60% through greater integration of an intelligent mix of hard IP and programmability
- Cut power consumption by 65% using innovative, efficient power management
- Shrink development time by 50% through effective IP reuse and enhanced ease-of-use
- Achieve over 1Tbps bandwidth for flexible, high-speed system interfacing

Fast Time to Innovation

Xilinx Targeted Design Platforms deliver integrated software and hardware components that enable designers to focus on innovation as soon as their development cycle begins. Targeted Design Platforms consist of advanced FPGA silicon and design tools, IP cores, development boards, and reference designs from Xilinx and third parties. These resources allow engineers to spend less time working on application infrastructure and more time on the portion of their design that delivers the unique, differentiating value to their electronic systems.

**TARGETED DESIGN PLATFORM BREAKOUT**

- Focus Your Time and Domain Expertise on Differentiation
  - Communication • Video • Broadcast, etc.
  - Market-specific IP, Custom Tools, Custom Boards
- Embedded • DSP • Connectivity
  - Domain IP, Domain Tools, FMC Daughter Cards
- Virtex • Spartan
  - Base IP, ISE FPGA Tools, Base Boards

**CUSTOMER DESIGN**
**MARKET-SPECIFIC**
**DOMAIN-SPECIFIC**
**BASE PLATFORM**
THE MOST COMPREHENSIVE FPGA OFFERINGS

The high-performance Virtex®-6 and low-cost Spartan®-6 FPGA families build upon 25 years of Xilinx market and technology leadership by exploiting the performance and cost benefits of advanced process technologies and setting new benchmarks for performance.

Maximum Flexibility and Scalability

Virtex-6 and Spartan-6 FPGAs offer maximum flexibility and scalability for meeting system requirements by sharing a common architecture. Designers can take advantage of hundreds of IP cores and reference designs across development platforms from Xilinx and its network of third-party vendors.

Two Families — a Broad Range of Logic Capacity and Capabilities

- 3,800 to 760,000 logic cells
- 216Kbits to 38,304Kbits block RAM
- 8 to 2,106 DSP slices delivering over 1,000 GMACs DSP bandwidth
- 100 to 1,200 SelectIO™ interface pins supporting DDR2 and DDR3 memories
- Up to 72 transceivers delivering line rates beyond 11Gbps
- Integrated PCI Express® technology
- Built-in system monitor function*

*Virtex only
Today’s FPGAs deliver the performance, cost, power-consumption, and capacity that at one time could only be met by custom ICs or application-specific standard parts (ASSPs).

The two families help designers stay on top of today’s system requirements with on-chip transceivers, integrated PCI Express®-compliant hard blocks, DSP capabilities, embedded memories, and support for advanced memory technologies.

Spartan-6 FPGA Families

The high-performance, high-density Virtex®-6 FPGA family comprises three domain-optimized sub-families, delivering different feature mixes to best address a variety of customer applications that require either connectivity, DSP, or logic optimization in the FPGA. Flip-chip packaging technology ensures the signal integrity requirements for new levels of FPGA performance. Once your design is fixed and no longer requires the Virtex FPGA’s full programmability, use EasyPath™ devices for conversion-free cost reduction.

Virtex-6 FPGA Families

The high-performance, high-density Virtex®-6 FPGA family comprises two domain-optimized sub-families with a mix of features optimized for cost and connectivity to match the stringent requirements driven by price-sensitive, high-volume applications. The family uses a cost-optimized architecture derived from the high-performance Virtex series, and uses wire-bond packaging to further drive down costs.
Lower Costs Through Integration
Advanced process technology and six-input LUT architecture in both the Virtex-6 and Spartan-6 FPGAs enable implementation of complex, high-performance functionality with smaller devices in the least expensive speed grade. Built-in transceivers reduce part count, while integrated functionality such as DSP slices and PCI Express® blocks increase logic efficiency. Low power consumption enables smaller heat sinks, fans, and power supplies.

Manage Power Without Sacrificing Performance
Xilinx addressed the challenge of controlling power in every aspect of the design of Virtex-6 and Spartan-6 FPGAs. Third-generation triple-oxide technology controls static power while process shrink reduces dynamic power consumption. Integrated blocks for widely used functions provide significant power savings. The six-input LUT-based logic architecture’s abundant flip-flops enable efficient, highly pipelined design implementations for high performance. Spartan-6 FPGAs include flexible power-saving hibernate and suspend modes and both families offer low-voltage device options for addressing the strictest power budgets.

Implement PCI Express® Interfaces Quickly
Xilinx third-generation integrated PCI Express interface blocks work with built-in transceivers and simplify implementation of this popular interface standard. As a result, fewer logic resources are required compared to soft IP implementations that force designers to pay more in terms of area, power, and cost.
The sixth generation in the Spartan FPGA Series, the Spartan-6 FPGA family is fabricated on a proven, low-power 45-nanometer (nm), nine-metal layer, dual-oxide process technology to deliver an optimal balance of low risk, low cost, low power, and high performance. Virtex-6 FPGAs are fabricated on a high-performance, 40nm, triple-oxide, 12-metal layer process. This combination of advanced silicon technology, innovative circuit design techniques, and architectural enhancements enables Virtex-6 FPGAs to deliver significantly lower power consumption, higher performance, and lower cost than previous-generation Virtex devices and competing FPGAs.

**Easily Build High-Bandwidth Memory Interfaces**

Flexible SelectIO™ technology makes it easy to build reliable, high-performance interfaces. Automatic compensation for pin-to-pin skew simplifies board design. Simplified interfacing to advanced memory devices like DDR3 with built-in memory controller blocks in Spartan-6 FPGAs and a Memory Interface Generator (MIG) tool to speed development of customized interfaces with Virtex-6 FPGAs.

**Simplify High-Speed Serial Implementation**

Xilinx led the industry with the integration of high-speed serial transceivers in Virtex FPGAs that reduce pin/trace count, simplify board design, and reduce manufacturing costs. Now this technology is available in low-cost Spartan-6 FPGAs with 3.125Gbps GTP transceivers. Virtex-6 FPGAs support line rates of 6.5Gbps with GTX transceivers and greater than 11Gbps with GTH transceivers.

**Build High-Performance Processing Systems**

Build customized embedded systems that meet your unique and exacting requirements using the Xilinx MicroBlaze™ soft processor cores supported by system IP, development tools, and many Real Time Operating Systems (RTOS) such as Linux. Achieve industry-leading digital signal processing (DSP) performance (more than 1,000 GMACs performance with Virtex-6 family) with on-chip DSP slices.

**ISE Design Suite**

**Logic Edition** provides rapid access to a complete front-to-back FPGA flow with tools and base-level IP for design entry, pin assignment, synthesis, verification (including on-chip debug), implementation, floor planning/analysis, bitstream generation, and device programming tools.

**Embedded Edition** provides embedded development tools and IP tailored to the needs of embedded systems developers who are incorporating one or more processors into their FPGA design. The Embedded Edition includes the base-level FPGA design tools and technologies. For embedded software developers, Xilinx also offers a standalone Eclipse™-based Software Development Kit.

**DSP Edition** provides DSP development tools and IP tailored to the needs of algorithm, system, and hardware developers alike, along with the base-level FPGA design tools and technologies.

**System Edition** is an integrated software solution supporting the combined methodologies of logic/ connectivity, embedded, and DSP design, delivering performance and customization across a wide range of end markets, while enabling design flows leveraging a combination of embedded and DSP methodologies.
Flexible and Scalable Development Kits

DEVELOPMENT KITS FROM XILINX COMBINE “TARGETED” AND “TESTED” RESOURCES IN THE FORM OF HARDWARE, DEVELOPMENT TOOLS, IP, AND REFERENCE DESIGNS, ENABLING YOU TO IMMEDIATELY BEGIN DEVELOPING, INTEGRATING, AND DEBUGGING SYSTEM LOGIC, INTERFACES, AND SOFTWARE. FPGA MEZZANINE CARD (FMC) DAUGHTER BOARDS FROM XILINX AND THIRD PARTIES ENABLE EXPANSION WITH DOMAIN-SPECIFIC, MARKET-SPECIFIC, AND CUSTOMER-SPECIFIC CAPABILITIES.

Kits for Virtex-6 FPGAs

<table>
<thead>
<tr>
<th>Kit Description</th>
<th>Feature Description</th>
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</thead>
<tbody>
<tr>
<td>Virtex-6 FPGA ML605 Evaluation Kit</td>
<td>A full-featured, highly-scalable development environment for high-performance applications</td>
</tr>
<tr>
<td>Virtex-6 FPGA Connectivity Kit</td>
<td>Enables designers to build high-speed serial and other connectivity applications</td>
</tr>
<tr>
<td>Virtex-6 FPGA ML623 MGT Characterization Kit</td>
<td>For comprehensive characterization of Virtex-6 FPGA high-speed serial transceivers</td>
</tr>
<tr>
<td>Virtex-6 FPGA Embedded Kit</td>
<td>Gives hardware and software developers a basic platform for building high-performance embedded applications</td>
</tr>
<tr>
<td>Virtex-6 FPGA DSP Kit</td>
<td>Accelerates DSP development with reference designs for building digital signal processing-based applications</td>
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Kits for Spartan-6 FPGAs

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<th>Kit Description</th>
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<tr>
<td>Spartan-6® FPGA SP601 Evaluation Kit</td>
<td>Entry-level environment for evaluating the Spartan-6 family</td>
</tr>
<tr>
<td>Spartan-6 FPGA SP605 Evaluation Kit</td>
<td>Full-featured kit for developing low-cost applications requiring high-speed serial connectivity</td>
</tr>
<tr>
<td>Spartan-6 FPGA Embedded Kit</td>
<td>Gives hardware and software developers a basic platform for building low-cost embedded applications</td>
</tr>
<tr>
<td>Spartan-6 FPGA DSP Kit</td>
<td>Kick-starts development of DSP applications with reference designs for digital signal processing-based applications</td>
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<tr>
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Daughter Cards Extend Board Capabilities

FMC daughter cards enable domain- and market-specific applications

<table>
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<th>FMC Card Description</th>
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<tr>
<td>FMC-Debug</td>
<td>Expand the capabilities of your development board with daughter cards based on the FMC standard. Initial offerings include cards for parallel and serial interfaces, video interface circuitry, and general purpose</td>
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<tr>
<td>FMC-Conn</td>
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<tr>
<td>FMC-LVDS1</td>
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<td>FMC-LVDS2</td>
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VISIT WWW.XILINX.COM/KITS FOR TECHNICAL DETAILS, AVAILABILITY, AND ORDERING INFORMATION FOR EACH OF THESE DEVELOPMENT KITS.
XILINX ENGINEERING SERVICES

Xilinx Engineering Services enhance the fundamental value of the Targeted Design Platforms, enabling customers to focus their efforts on their core competencies by augmenting their design team with skilled engineering resources capable of providing expert design-specific advice. Xilinx tailors these services, ranging from hands-on training to full design creation and implementation, to accommodate specific customer requirements. Visit [http://www.xilinx.com/services](http://www.xilinx.com/services) to learn more about the Xilinx services portfolio.

THE XILINX FPGA ECOSYSTEM

Over the years, Xilinx and its network of third-party vendors have developed a robust ecosystem of IP, boards, tools, services, and support. As we move forward, Xilinx Targeted Design Platforms will be extensible through third-party IP, software, boards, and design services as we transition from a closed platform approach to an open platform approach by moving to industry standards and interfaces. In the IP area, Xilinx is moving to interconnect standards, IP repository standards, and industry-standard encryption methods.

These changes provide significant benefits to designers and third-party vendors by enabling them to more easily integrate their products and services into a standardized development, integration, and delivery methodology.
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TAKE THE NEXT STEP
VISIT US ONLINE AT www.XILINX.COM

For more information on Xilinx and its Targeted Design Platforms, visit:
www.xilinx.com/6

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Printed in the U.S.A.  PN 2401