



FASTER DEVELOPMENT CYCLES AND
INCREASED MARKET AGILITY WITH THE
POWER OF REPROGRAMMABILITY

XILINX IN CONSUMER ELECTRONICS: ACCELERATING DIFFERENTIATION AND INNOVATION

➤ Challenges Facing Consumer Electronics Designers

- Fierce competition, with resulting pressures to shorten design cycles, regionalize, and increase differentiation
- Rapidly evolving standards and offerings, requiring ability to integrate features in weeks instead of years
- Sophisticated customers, who want more—performance and connectivity—for less
- Environmental issues are driving mandatory lower power and hazardous substance removal in consumer electronics

➤ The Xilinx Solution

- Flexible, power-efficient devices that drive down costs and enable system-on-chip (SoC) designs
- Extensive connectivity and throughput that supports evolving interconnect standards and Internet-enabled applications
- Comprehensive platform methodology, to accelerate time to innovation and maximize agility
- Rich set of Xilinx and third-party IP building blocks, tailored to fuel advances for today's and tomorrow's applications

The consumer electronics industry is advancing at a faster pace than ever, and designers face unprecedented challenges. Consumers are embracing digital media, and want anytime, anywhere access to content that is growing at astronomical rates. Product innovations have raised the level of design complexity. For example, display designs must address higher resolutions, faster refresh rates, and continuously improve image quality, all of which are increasing the burden on each system component. New competitors and a rapid fire of new products have changed segments of the industry—demanding shorter development cycles in order to stay competitive.

Xilinx understands the demands and dynamics of this market. The power and cost benefits of reprogrammability are even more relevant today. Instead of 18 months to tape out with ASICs, designers can control and modify FPGA designs at any point in the lifecycle. And the current generation of Xilinx Spartan®-6 FPGAs give designers a low-risk solution that optimally balances cost, power, and performance for cost-sensitive projects. Besides competitively priced silicon advancements, Xilinx provides a Targeted Design Platform methodology that combines the necessary hardware, design tools, market-specific intellectual property (IP) cores, development boards, and pre-validated reference designs to get FPGA-based products to market sooner and give designers more time to differentiate. Xilinx customers can more quickly integrate, refine algorithms, and develop unique features, making Xilinx platforms the right choice for:

- **Digital televisions and displays**
- **Digital cameras/camcorders**
- **Multi-function printers**
- **Portable handheld electronics/eReaders**
- **Set-top boxes**

Spartan-6 FPGAs: Advanced Silicon Solutions

Xilinx Spartan-6 FPGAs offer the flexibility to cost-effectively change, enhance, or regionalize designs quickly, making the devices ideal for project teams who need to rapidly introduce new features or support emerging protocols and standards.

Besides flexibility, these devices deliver the connectivity and ability to perform the real-time video processing required for dynamic high-resolution video, image processing, and high-speed interconnects. These attributes of the high-capacity Spartan-6 family enable scalable, single-chip implementation that can lower bill-of-material (BOM) costs while enabling superior consumer experiences. Integrated SelectIO™ technology and high-speed transceivers give designers cost-effective options for increasing throughput and improving signal integrity.

Xilinx has also pioneered power breakthroughs for FPGA-based designs. The Spartan-6 family combines low-power 45nm process technology with advanced power management. Designers can reduce overall power consumption, extend battery life for portable electronics, simplify thermal management, and increase reliability. The power reductions simultaneously please consumers and help manufacturers comply with mandates for energy efficiencies. With RoHS compliance and lead-free packaging, the Spartan-6 FPGA family can also help designers meet green initiatives.

A Comprehensive Design Methodology and Ecosystem

To accelerate design cycles, Xilinx provides a complete development environment that supports the latest video standards such as DisplayPort, V-by-One HS and HDMI 1.4a. Xilinx Targeted Design Platforms—a comprehensive set of hardware, software, design tools, IP cores, development boards, and reference designs—foster time-saving methodologies and free consumer electronics designers to focus on differentiation right from the start of each project. Today, application developers can reduce system costs by up to 60% by minimizing integration efforts and jump-starting a design with a mix of hard IP and programmability. IP reuse and enhanced ease of use yield additional time savings.

Getting Results that Span Diverse Consumer Applications

Spartan-6 FPGAs are at the heart of many next-generation consumer electronics offerings, including the majority of 3D digital TVs, emerging eReaders, and advanced image-processing solutions for digital cameras and camcorders. Within each of the major application areas, Xilinx solutions are helping to drive innovations to market faster and more cost-effectively.

Extensive IP Library for Complete Systems

An extensive library of intellectual property (IP) available from Xilinx and its Alliance members can be leveraged as the foundation for complete consumer electronics designs.

Please visit www.xilinx.com/esp/consumer/available_ip.htm for a complete list of available IP for consumer applications.

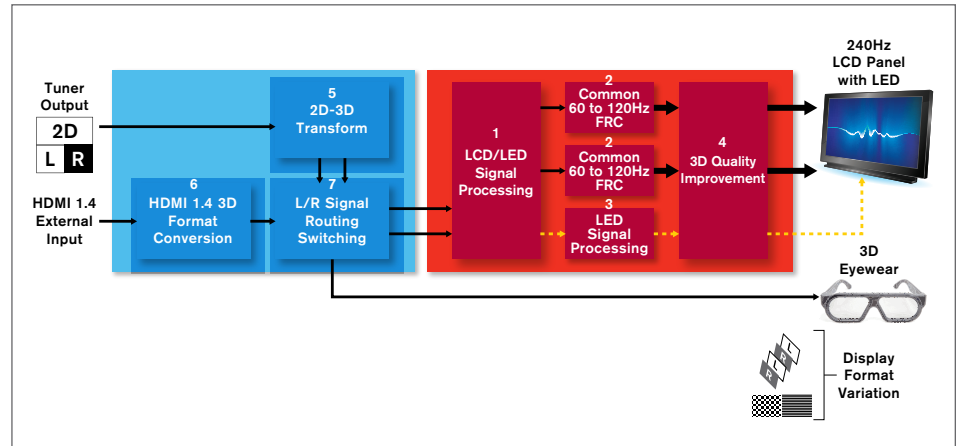
SAMPLE IP FOR DIGITAL DISPLAY AND VIDEO

TYPE	DESCRIPTION
Color Optimizer	Adaptive color saturation enhancement of pixels using the luminance and chrominance values, resulting in increased color based image contrast and enhanced image detail.
Contrast Enhancer	Real-time contrast enhancement based on advanced algorithm that performs adaptive smart stretching according to image content.
Adaptive Image Enhancement	Space-varying dynamic range correction to still images and real-time video, using proprietary algorithms based on the human visual system.

XILINX 3DTV APPLICATION

Digital Televisions and Displays

A rich library of image-enhancement IP helps to improve picture quality through dynamic gamma correction, motion adaptive temporal noise reduction, dynamic range compression, and more. For high-speed interconnections between display and tuner components, Spartan-6 FPGAs provide high-speed connectivity including DisplayPort-enabled 3.125Gbps GTP transceivers.



Xilinx FPGAs enable designers to meet the video processing and bandwidth requirements of emerging display technologies such as 3DTV, LED local dimming and 4K2K (Quad HD), while improving picture quality and reducing shortening development time.

Digital Cameras and Camcorders

With integrated mass storage and high-speed interfacing, Spartan-6 FPGAs provide a cost-effective solution for image pre-processing, motor functions, or storage of images. Xilinx Image Processing Pipeline LogiCORE™ IP offloads these designers from image enhancement, auto focus, white processing, lens control, and other functions.

Multifunction Printers

High-capacity Spartan-6 FPGAs enable single-chip implementations with high-speed serial interconnects and integration of main control for the printer board, printer engine functions, image scanning, image processing, and mechanical control.

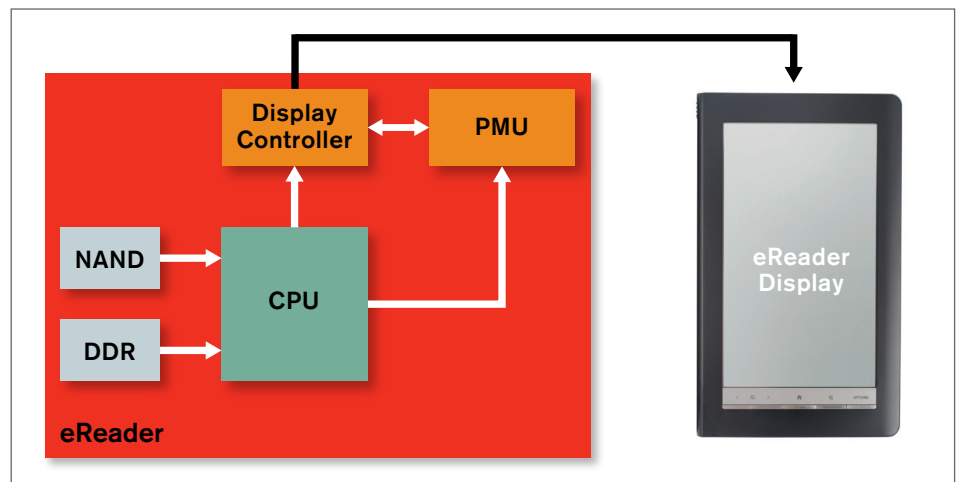
Portable Handheld Electronics/eReaders

The flexible and ultra-low-power Spartan-6 FPGA-based solutions allow designers to rapidly integrate new features and support for emerging standards to enable next-generation devices such as eReaders, smartphones, personal navigation devices, digital photo frames, media players, and gaming consoles.

Set-Top Boxes

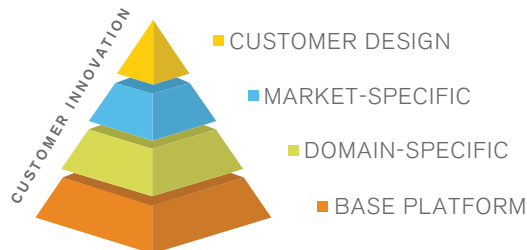
To rapidly comply with new industry regulations or adopt an emerging protocol, designers are embracing the flexibility of Xilinx FPGA platforms. Instead of waiting months for an ASSP supplier to release a new device, reprogrammability enables enhancements in a matter of weeks.

XILINX EREADER APPLICATION



Xilinx FPGAs are optimal for controlling emerging display technology such as electrophoretic displays (EPDs) used in eReaders.

XILINX TARGETED DESIGN PLATFORMS



Xilinx Targeted Design Platforms speed time to market and free designers to focus on innovation and differentiation. The integration of FPGA devices, design tools, and IP into targeted reference designs that run on development or evaluation boards creates a robust development and run-time environment. The platforms help designers more quickly learn about FPGAs and leverage standard or modified tools and IP to accelerate development. Xilinx teams up with industry leaders to build customized Base, Domain-Specific, and Market-Specific variations of the Targeted Design Platform, each introducing common methodologies to benefit both hardware designers and software application developers.

TYPE	TARGETED APPLICATIONS	PLATFORM COMPONENTS
Base	Fundamental development and run-time capabilities	FPGA silicon ISE Design Suite design environment and appropriate third-party development tools Reference designs (e.g., memory interface and configuration designs) Evaluation or development boards Common IP (PCIe, GigE, Ethernet, etc.)
Domain-Specific	Digital Signal Processing (DSP)	Base Targeted Design Platform, plus: <ul style="list-style-type: none"> Higher-level design tools (MATLAB, Simulink, AutoESL) DSP IP DSP targeted reference designs DSP specific FMC
	Connectivity	Base Targeted Design Platform, plus: <ul style="list-style-type: none"> Higher-level design tools (serial characterization tools) Connectivity IP (PCIe, XAUI, etc) Connectivity targeted reference designs Connectivity specific FMC daughter cards
	Embedded Processors	Base Targeted Design Platform, plus: <ul style="list-style-type: none"> Higher-level design tools (EDK, Operating Systems, etc) Embedded IP Embedded targeted reference designs Embedded specific FMC daughter cards
Market-Specific	Automotive, consumer electronics, and others	Components from both Base and Domain-Specific Platforms, plus market-optimized reference designs and boards, higher-level design tools, and extensive third-party IP

Take the NEXT STEP

For more information on Xilinx consumer electronics platforms and solutions, visit www.xilinx.com/esp/consumer

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