Accelerate Time to Market with System-Level Development Kits for Virtex-II Applications

Avnet Design Services has developed two new kits to help you get your Virtex-II design off the drawing board and into a working system in record time.

by Warren Miller
VP of Marketing, Avnet Design Services
warren.miller@avnet.com

With capacity in the multimillion-system gate range, the new Virtex™-II family of Platform FPGAs can now fully contain the key system building blocks required for next-generation applications. This new class of FPGAs requires a new approach to development platforms. In response, Avnet Design Services has created two new design kits – the basic Virtex-II Evaluation Kit and the full-featured Virtex-II Development Platform. These boards can help you learn, evaluate, prototype, develop, and get your Virtex-II based application to market ahead of the competition.

The Virtex-II Development Platform offers a robust, flexible development platform that can be used to kick start a system-level design. It includes a Virtex-II Platform FPGA connected to a PCI bus, a wealth of DRAM, and the most commonly used I/O ports for peripherals. Also included are four innovative, high-speed AvBus connectors. These connectors provide "personalization plugs" that accept Avnet daughtercards for additional hardware needed by specific applications. By plugging in off-the-shelf building blocks or making custom AvBus compliant cards, you can create the development platform you need to give your design a turbocharged time to market. There's no need to wait for prototype PC boards when you can build your own prototype with "plug and go" Avnet development boards.

In addition to the full-featured development platform, Avnet Design Services has also produced a simple Virtex-II

Evaluation Kit. This kit allows you to evaluate the Virtex-II technology and to learn more than you could from just reading a datasheet. (Avnet Design Services offers hands-on customer workshops, online learning, and self-study courseware to support customers who wish to quickly learn the technical details of new Xilinx products.) The evaluation kit does not have all the supporting components and interfaces available on the development platform, but it does feature seven-segment and single-bit LEDs, switches, an RS-232 port, general purpose I/O
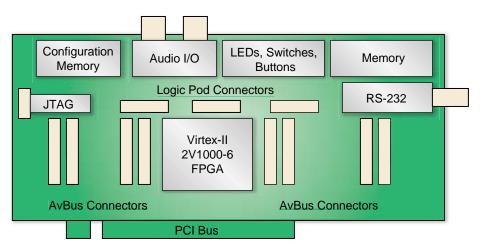

Figure 1 - Avnet Virtex-II Development Platform

connectors, and a JTAG port. The evaluation kit supports a variety of hands-on labs and simple breadboard designs to evaluate the Virtex-II device and architecture, but to implement a real application, you will need the full-featured development platform.

Virtex-II Development Platform

A diagram of the Virtex-II Development Platform is shown in Figure 1. The Virtex-II 2V1000-6 FPGA provides all the logic resources for the board. It connects to the 64-bit/66 MHz PCI bus, which can also run at 32-bit/33 MHz. The Xilinx PCI Core can be used to interface to the PCI bus and can be purchased as an option with the development kit.

The platform's SDRAM module interfaces directly to the FPGA and uses Xilinx

Controlled Impedance TEchnology (XCITE) for digitally controlled impedance matching. This impedance-matching capability improves performance, reduces noise, and eliminates the need for external matching resistors on the memory signal pins. It also allows the signals to be optimized for the specific memory module used in the design.

The standard components connected to the Platform FPGA are an RS-232 port, an audio I/O port, several switches, LEDs, and a JTAG port for configuration and testing. The RS-232 port is convenient for remote control and diagnostics of the application running on the development board. The RS-232 port may also be a native part of the user's application. The audio port is useful in applications such as MP3 encoding and decoding, speech recognition and synthesis, diagnostics, and audio alarms. The switches and LEDs provide the normal user feedback and configuration settings needed during development.

To simplify the use of high-speed logic analysis, the board provides several standard connectors. These connectors are compatible with the Tektronix logic analyzer and provide access to many of the key signals in a design. The signal access pods from the logic analyzer plug directly into the connectors on the board to achieve clean, high speed connections. This configuration makes it easy to probe the pins of the surface mount devices on the board and speeds debug and test set-up substantially.

The four AvBus connectors connect to the remaining signals and turn the development board into a real platform for sys-

tem applications and IP core development. You can select from a variety of off-the-shelf hardware modules, compliant with the AvBus specification, to build a complete and application-specific development platform. This allows hardware integration and testing to begin immediately, skipping the lengthy process of designing and building a prototype PC board. This building-block approach, using the AvBus-based platform, reduces development time dramatically, making changes a matter of minutes or days, not weeks.

Development Platform Contents

The development platform kit includes the board, detailed user manual, datasheet, quick start guide, and schematics. A demonstration program, along with the source code and netlist, is also provided. The demo program gives several examples and interfaces for all the peripherals and AvBus connectors. These code interfaces make it easy to connect to the appropriate FPGA pins and resources for accessing memory, LEDs, switches, RS-232 port, and audio. With this kit, you can have a simple design up and running in a day.

Available as options are a variety of Xilinx FPGA development tools, IP cores, and Avnet daughtercard modules, as well as applications and design services support. You can purchase Xilinx Foundation™ ISE software packages like Foundation Elite if you don't already have a Xilinx develop-
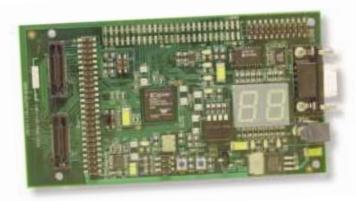
Available Daughtercards	Planned Daughtercards
DDR (Double Data Rate)-SDRAM	PowerPC processor module
Ethernet PHY interface	ARM processor module
High speed digital-to-analog/ analog-to-digital converters	UTOPIA (Universal Test and Operation PHY Interface for ATM) interface
Modem	Wireless modem
FireWire PHY interface	DSP (Digital Signal Processor) module

Table 1 - Current and planned AvBus daughtercards

ment environment. IP cores for PCI are also available as options and support 32-bit/33 MHz to 64-bit/66 MHz operation. The current and planned daughtercard modules for the Virtex-II Development Platform kit are listed in Table 1.

Avnet Design Services, in conjunction with Xilinx and other Avnet-distributed semiconductor manufacturers, will be creating reference designs targeted at specific applications using the Virtex-II Development Platform.

Virtex-II Evaluation Kit

A photograph of the Virtex-II Evaluation Kit board is shown in Figure 2. The Virtex-II 2V40-6 FPGA is the heart of the board and connects to the RS-232 port, the LEDs and switches, the general purpose I/O connectors, and the AvBus daughtercard connector.

The RS-232 port provides a simple communication port for diagnostics and simple application development. The switches and LEDs provide the normal initialization, input and output required by your design. The general-purpose I/O connectors allow you to interface the board to

existing hardware to provide any needed I/O capability – perhaps to test or debug a portion of a design or to evaluate an IP core. The AvBus daughtercard connector can be used to plug the card into an AvBus-compliant development platform, giving the platform additional logic capability and access to features available only in the Virtex-II family of FPGAs.

Avnet Design Services – At Your Service

Avnet Design Services is the technical arm of Avnet Inc, a worldwide leader in electronics distribution. ADS has several design centers around the world staffed with FPGA design consultants available to assist you with your design. ADS also has an army of field application engineers (FAEs) knowledgeable in the design of applications using Xilinx FPGA devices, technology, and tools. These engineers, available to Avnet customers, can help you understand, select and design with Xilinx FPGAs and can also recommend the ADS FPGA kit that would be the best for your design needs.

Visit www.ads.avnet.com for more information on fee-for-service design consulting and to get current availability, pricing, and technical literature on the Virtex-II Development Platform and Virtex-II Evaluation Kit.

Figure 2 - Avnet Virtex-II Evaluation Kit