XMC Modules

XMC-6VLX User-Configurable Virtex-6 FPGA Modules

Description
Acromag's XMC-6VLX modules feature a high-performance user-configurable Xilinx® Virtex®-6 FPGA enhanced with high-speed memory and a high-throughput serial interface. The result is a powerful and flexible I/O processor module that is capable of executing custom instruction sets and algorithms.

The logic-optimized FPGA is well-suited for a broad range of applications. Typical uses include hardware simulation, communications, in-circuit diagnostics, military servers, signal intelligence, and image processing.

Two Versions: Rear I/O or Front + Rear
Two versions of this module are available, each offering a choice of an FPGA device with 240k or 365k logic cells. One version provides only rear I/O for use in air or conduction-cooled systems. The other version adds two SFP ports and a 36-pin connector on the front but only supports air-cooled systems.

On all versions, the rear I/O provides an 8-lane high-speed serial interfaces on both the P15 and P16 XMC ports for PCI Express, Serial RapidIO, 10-Gigabit Ethernet, or Xilinx Aurora implementation. P16 also supports 34 SelectIO channels. The P4 port adds another 60 SelectIO and 2 global clock lines. Select I/O signals are Virtex-6 FPGA I/O pins that support single-ended I/O (LVCMOS, HSTL, SSTL) and differential I/O standards (LVDS, HT, LVPECL, BLVDS, HSTL, SSTL).

Models with front I/O add dual SFP ports and a VHDCR connector. The two SFP ports each provide a copper or fibre interface of up to 2.5Gbps. They also support a Gigabit Ethernet interface. The VHDCR connector interfaces JTAG, USB, and 22 SelectIO.

With Acromag's Virtex-6 FPGA modules, you can greatly increase DSP algorithm performance for faster throughput using multiple channels and parallel hardware architectures. Free up DSP processor CPU cycles by offloading algorithm-intensive tasks to the FPGA co-processor.

These modules are ideal for high-performance customized embedded systems. Optimize your system performance by integrating high-speed programmable logic with the flexibility of software running on MicroBlaze™ soft processors.

Acromag's Engineering Design Kit provides software utilities and example VHDL code to simplify your program development and get you running quickly. A JTAG interface enables on-board VHDL debugging. Additional Xilinx tools help finish your system faster. Maximize FPGA performance with ISE® Design Suite. And with ChipScope™ Pro tools, you can rapidly debug logic and serial interfaces.

Key Features & Benefits
- Reconfigurable Xilinx Virtex-6 FPGA with 240k or 365k logic cells
- 2M x 72-bit QDRII SRAM, 128M x 64-bit DDR3 SDRAM
- 16M x 16-bit parallel flash memory for MicroBlaze program code storage
- 128Mb flash memory to store power-up configuration bit file for Virtex-6 FPGA
- Dual 8-lane high-speed serial interfaces on rear P15 and P16 connectors for PCIe Gen 1/2, Serial RapidIO, 10Gb Ethernet, Xilinx Aurora
- Dual SFP ports for Fibre Channel or GbE
- 60 SelectIO or 30 LVDS pairs plus 2 global clock pairs direct to FPGA via rear P4 port
- 34 SelectIO or 17 LVDS pairs plus 2 global clock pairs direct to FPGA via rear P16 port
- 22 SelectIO, 2 global clock pairs, JTAG, USB, and ground signals via front 36-pin connector
- DMA support provides data transfer between system memory and the on-board memory
- Support for Xilinx ChipScope™ Pro interface
- Designed for conduction-cooled host card or up to -40 to 85°C operation

Acromag
THE LEADER IN INDUSTRIAL I/O

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Performance Specifications

- **FPGA**
  - FPGA device
  - Xilinx Virtex-6 FPGA.
  - Model XC6VLX240 FPGA with 241,152 logic cells and 768 DSP48E1 slices or Model XC6VLX365T with 364,032 logic cells and 576 DSP48E1 slices.
  - FPGA configuration
  - Download via JTAG or flash memory.
- **Example FPGA program**
  - VHDL provided for bus interface, front & rear I/O control, SRAM read/write interface logic, and SDRAM memory interface controller. See EDK kit.

I/O Processing

- **Front high-speed I/O**
  - Two x1 lanes via SFP connectors for Gigabit Ethernet and Fibre Channel interface
- **Front user I/O**
  - 36-pin connector provides JTAG connection, USB signals, 2 global differential clock pairs, 11 LVDS signal pairs, and 2 ground signals.
- **Rear high-speed I/O**
  - 16 high-speed serial lanes.
  - 8x lanes via P15 and 8x lanes via P16.
- **Rear user I/O**
  - P16: 17 LVDS pairs (34 LVCMOS), 2 global clock pairs.
  - P4: 30 LVDS pairs (60 LVCMOS), 2 global clock pairs.

Engineering Design Kit

- Provides user with basic information required to develop a custom FPGA program. Kit must be ordered with the first purchase of a XMC-6VLX module (see www.acromag.com for more information).

XMC Compliance

- Complies with ANSI/VITA 42.0 specification for XMC module mechanicals and connectors.
- Complies with ANSI/VITA 42.3 specification for XMC modules with PCI Express interface.
- Electrical/Mechanical Interface: Single-Width Module.

Environmental

- **Operating temperature**
  - Standard models: 0 to 70°C
  - E versions with SFP front I/O: -20 to 85°C.
  - E versions without SFP front I/O: -40 to 85°C.
- **Storage temperature**
  - -55 to 125°C.
- **Relative humidity**
  - 5 to 95% non-condensing.
- **Power**
  - 3.3V (±5%): Application dependent.
  - 12V (±5%): Application dependent.
- **MTBF**
  - Contact the factory.

Ordering Information

- NOTE: XMC-6VLX-EDK is required to configure FPGA.

- **XMC Modules**
  - XMC-6VLX240
    - User-configurable Virtex-6 FPGA, 240k logic cells, no front I/O
  - XMC-6VLX240E
    - Same as XMC-6VLX240 plus extended temp. range
  - XMC-6VLX240F
    - Same as XMC-6VLX240 plus SFP front I/O
  - XMC-6VLX240FE
    - Same as XMC-6VLX240F plus extended temp. range
  - XMC-6VLX365
    - User-configurable Virtex-6 FPGA, 365k logic cells, no front I/O
  - XMC-6VLX365E
    - Same as XMC-6VLX365 plus extended temp. range
  - XMC-6VLX365F
    - Same as XMC-6VLX365 plus SFP front I/O
  - XMC-6VLX365FE
    - Same as XMC-6VLX365F plus extended temp. range

- **Accessories**
  - For more information, see www.acromag.com.

- **Software**
  - For more information, see www.acromag.com.
  - XMC-6VLX-EDK
    - Engineering Design Kit (one kit required)
  - PMCSW-API-VXW
    - VxWorks® software support package
  - PCISW-API-WIN32
    - 32-bit Windows® DLL software support package
  - PCISW-API-WIN64
    - 64-bit Windows® DLL software support package
  - PCISW-LINUX
    - Linux™ support (website download only)

- **XMC-6VLX**
  - User-Configurable Virtex-6 FPGA Modules

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