VPX514

FPGA Carrier with FMC Interface, 6U VPX

VPX514

Key Features

- VPX (VITA 46) FPGA carrier for FPGA Mezzanine Card (FMC) per VITA 57
- Option for up to 4 GB of DDR3 memory
- Dual 10GbE via SFP+ interfaces
- Xilinx Virtex®-6 FPGA in FF1759 package
- Onboard PLL for buffering/multiplying and jitter cleaner
- Onboard Freescale QorIQ PPC1020 with DDR3

Benefits

- VPX514 only takes power from the VPX chassis (there are no other interfaces going to the back plane)
- Reference design with VHDL source code speeds application development
- Electrical, mechanical, software, and system-level expertise in house
- Full system supply from industry leader
- AS9100 and ISO9001 certified company

OpenVPX™

vadatech
THE POWER OF VISION

VPX514

The VPX514 is an VPX FPGA Carrier with an FMC (VITA 57) interface and is compliant to the VPX VITA 46 specification. The FPGA has interface to four banks of DDR3 memory (32-bit wide). This enables large buffer sizes to be stored during processing as well as for queuing the data to the host.

The unit has a single FMC connector (VITA 57) that enables multiple/different FMC modules in the system.

The onboard PPC can run at 800 MHz with 512 MB of DDR3, 8 MB of boot flash and 128 MB of user Flash. The PPC has an x4 PCIe interface to the FPGA in addition to its local bus. The PPC has its dual GbE routed to Ports 0 and 1 of the VPX.

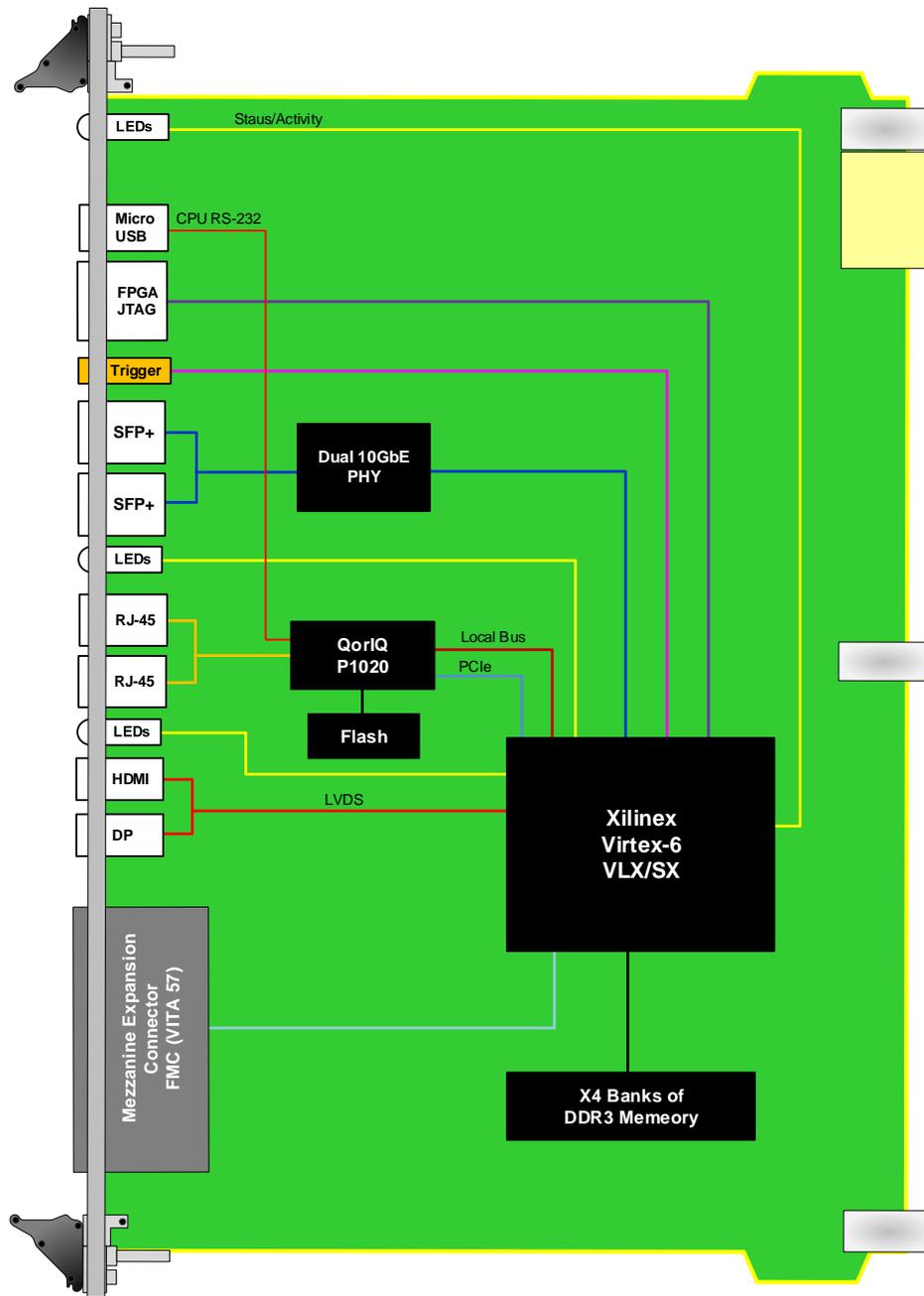Figure 1: VPX514

Block Diagram

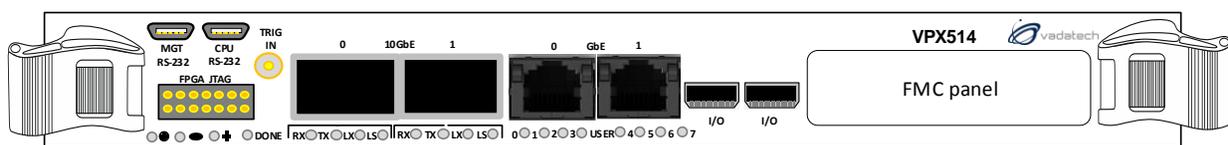Figure 2: VPX514 Functional Block Diagram

Front Panel

Figure 3: VPX514 Front Panel

VPX514 – FPGA Carrier with FMC Interface, 6U VPX

Reference Design

VadaTech provides an extensive range of Xilinx based FPGA products. The FPGA products are in two categories; FPGA boards with FMC carriers and FPGA products with high speed ADC and DACs. The FPGA products are designed in various architectures such as AMC modules, PCIe cards and Open VPX.

VadaTech provides a reference design implementation for our FPGAs complete with VHDL source code, documentation and configuration binaries. The reference design focuses on the I/O ring of the FPGA to demonstrate low-level operation of the interconnections between the FPGA and other circuits on the board and/or backplane. It is designed to prove out the hardware for early prototyping, engineering/factory diagnostics and customer acceptance of the hardware, but it does not strive to implement a particular end application. The reference VHDL reduces customer time to develop custom applications, as the code can be easily adapted to meet customer's application requirements.

The reference design allows you to test and validate the following functionality (where supported by the hardware):

- Base and Fabric channels
- Clocks
- Data transfers
- Memory
- User defined LEDs

Xilinx provides Vivado Design Suite for developing applications on Xilinx based FPGAs. VadaTech provides reference VHDL developed using the Vivado Design Suite for testing basic hardware functionality. The reference VHDL is provided royalty free to use and modify on VadaTech products, so can be used within applications at no additional cost. However, customers are restricted from redistributing the reference code and from use of this code for any other purpose (e.g. it should not be used on non-VadaTech hardware).

The reference VHDL is shipped in one or more files based on a number of ordering options. Not all ordering options have an impact on the FPGA and a new FPGA image is created for those options that have direct impact on the FPGA. Use the correct reference image to test your hardware. For more information, refer to the FPGA reference design manual for your device which can be accessed from the customer support site along with the reference images.

Supported Software

- Default FPGA image stored in flash memory
- Linux BSP
- Build Scripts
- Device Driver
- Reference application projects for other ordering options

The user may need to develop their own FPGA code or adapt VadaTech reference code to meet their application requirements. The supplied pre-compiled images may make use of hardware evaluation licenses, where necessary, instead of full licenses. This is because VadaTech does not provide licenses for the Vivado tool or Xilinx IP cores, so please contact Xilinx where these are required.

Xilinx also provides System Generator tools for developing Digital Signal Processing (DSP) applications.

See the following links:

Xilinx Vivado Design Suite, Xilinx System Generator for DSP.

Specifications

Architecture		
Physical	**Dimensions**	6U, 1" pitch
Type	**FPGA**	Xilinx Virtex-6®
	Memory	x4 Banks DDR3
		Single FMC slot
Standards		
VPX	**Type**	VITA 46 (FPGA Programmable)
Configuration		
Power	**VPX514**	~40W (without Mezzanine)
Front Panel	**JTAG**	Standard JTAG header
	Micro USB	RS-232 from FPGA
	Trigger	Trigger/In to FPGA
	1/10GbE	Dual SFP+
	RJ-45	x2 GbE
	HDMI	LVDS to FPGA
	DP	LVDS to FPGA
	LEDs	x8 User defined from FPGA
		GbE/10GbE Link/Activity
VPX Interfaces	**Slot Profiles**	See Ordering Options
Software	**Operating System**	Linux, Windows, Solaris and VxWorks
Other		
MTBF	MIL Hand book 217-F@ TBD hrs	
Certifications	Designed to meet FCC, CE and UL certifications, where applicable	
Standards	VadaTech is certified to both the ISO9001:2015 and AS9100D standards	
Warranty	Two (2) years, see VadaTech Terms and Conditions	

INTEGRATION SERVICES AND APPLICATION-READY PLATFORMS

VadaTech has a full ecosystem of OpenVPX, ATCA and MTCA products including chassis platforms, shelf managers, AMC modules, Switch and Payload Boards, Rear Transition Modules (RTMs), Power Modules, and more. The company also offers integration services as well as pre-configured Application-Ready Platforms. Please contact VadaTech Sales for more information.

Ordering Options

VPX514 – ABC-DE0-0HJ

A = DDR3 Memory	D = FPGA	
1 = No Memory 2 = 512 MB per bank (2 GB total) 3 = 1 GB per bank (4 GB total)	1 = Reserved 2 = Reserved 3 = Reserved 4 = XC6VLX240T 5 = XC6VLX365T 6 = XC6VLX550T 7 = XC6VSX475T 8 = Reserved	
B = SFP+ TXCVR for 1/10GbE Fabric	**E = FPGA Speed**	**H = Environmental**
0 = No SFP+ TXCVR 1 = 10GBase SR 2 = Reserved 3 = 10GBase LR 4 = 1G LC/SX (850nm) 5 = 1G LC/LX (1310nm) 6 = Copper 1000 Mbit 7 = Reserved	1 = Low 2 = High	See Environmental Specification
C = VPX Connector Type		**J = Conformal Coating**
0 = Standard 50u Gold Rugged 1 = KVPX Connectors		0 = No coating 1 = Humiseal 1A33 Polyurethane 2 = Humiseal 1B31 Acrylic

Notes: For operational reasons VadaTech reserves the right to supply a higher speed FPGA device than specified on any particular order/delivery at no additional cost, unless the customer has entered into a Revision Lock agreement with respect to this product.

Environmental Specification

	Air Cooled		Conduction Cooled		
Option H	**H = 0**	**H = 1**	**H = 2**	**H = 3**	**H = 4**
Operating Temperature	AC1* (0°C to +55°C)	AC3* (-40°C to +70°C)	CC1* (0°C to +55°C)	CC3* (-40°C to +70°C)	CC4* (-40°C to +85°C)
Storage Temperature	C1* (-40°C to +85°C)	C3* (-50°C to +100°C)	C1* (-40°C to +85°C)	C3* (-50°C to +100°C)	C3* (-50°C to +100°C)
Operating Vibration	V2* (0.04 g2/Hz max)	V2* (0.04 g2/Hz max)	V3* (0.1 g2/Hz max)	V3* (0.1 g2/Hz max)	V3 (0.1 g2/Hz max)
Storage Vibration	OS1* (20g)	OS1* (20g)	OS2* (40g)	OS2* (40g)	OS2* (40g)
Humidity	95% non-condensing	95% non-condensing	95% non-condensing	95% non-condensing	95% non-condensing

Notes: *Nomenclature per ANSI/VITA 47. Contact local sales office for conduction cooled (H = 2, 3, 4)

Contact

VadaTech Corporate Office

198 N. Gibson Road, Henderson, NV 89014

Phone: +1 702 896-3337 | Fax: +1 702 896-0332

Asia Pacific Sales Office

7 Floor, No. 2, Wenhu Street, Neihu District, Taipei 114, Taiwan

Phone: +886-2-2627-7655 | Fax: +886-2-2627-7792

VadaTech European Sales Office

VadaTech House, Bulls Copse Road, Southampton, SO40 9LR

Phone: +44 2380 016403

info@vadatech.com | www.vadatech.com

Choose VadaTech

We are technology leaders

- First-to-market silicon
- Constant innovation
- Open systems expertise

We commit to our customers

- Partnerships power innovation
- Collaborative approach
- Mutual success

We deliver complexity

- Complete signal chain
- System management
- Configurable solutions

We manufacture in-house

- Agile production
- Accelerated deployment
- AS9100 accredited

XILINX

ALLIANCE PROGRAM
CERTIFIED

vadatech
THE POWER OF VISION