PCI596

PCIe FPGA Carrier for FMC+, VU13P UltraScale+™

PCI596

Key Features

- PCIe x16 FPGA carrier for FMC+ per VITA 57.4
- Xilinx UltraScale+™ VU13P FPGA
- Allows expansion of a daughter card on top of the FMC for more I/O
- Active cooling for FPGA, FMC+ and the daughter card module
- ADC 12-bit @ 6.4 GSPS (ADC12DJ3200)
- Dual DAC 16-bit @ 12 GSPS (AD9164)
- Dual x8 lanes for direct connection to neighboring FPGA card(s)
- Single bank of 64-bit wide for 16 GB total

Benefits

- Based on the widely-used VadaTech PCI592/PCI595
- Strong BSP support and example code to support system bring-up
- Wide range of compatible FMCs, including ADC, DAC and networking
- Electrical, mechanical, software, and system-level expertise in house
- Full system supply from industry leader
- AS9100 and ISO9001 certified company

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The PCI596 is based on the Xilinx VU13P UltraScale+™ FPGA, which provides over 12,000 DSP slices, 360 Mb of UltraRAM and 3,780K logic cells. The FPGA interfaces directly to the FMC+ DP 0-31 and all FMC+ LA/HA/HB pairs, making it compatible with a wide range of industry standard VITA 57 and VITA 57.4 modules. It also has interface to DDR4 memory channels (1x 64-bit wide, 8 GB). This allows for large buffer sizes to be stored during processing as well as for queuing the data to the host.

The unit integrates the TI ADC12DJ3200 12-bit @ 6.4 GSPS (option for ADC12DJ2700) with dual DAC AD9164 at 16-bit @ 12 GSPS (option for AD9162) with Ultra-Low Noise VCXO.

PCI596 has x16 PCIe edge connector routed to the FPGA PCIe Gen4 hard IP block. In addition, 16 uncommitted connection pairs are routed to a dual x8 expansion connector, providing direct connectivity to a neighbouring FPGA (e.g. via Aurora, 10/40GbE, SRIO, PCIe) without the need to go through the host.

Active cooling of the FPGA and FMC+ (the module does support HSPCe connector) is provided, making it appropriate for power-hungry applications or those requiring temperature stability for good performance.

Figure 1: PCI596

Figure 2: PCI596 w/ the FMC109 installed

Figure 3: PCI596 w/ the FMC109 installed Front Panel

Reference Design

VadaTech provides a reference design implementation for our FPGAs, complete with VHDL source code 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 intended to prove out the hardware for engineering/factory diagnostics and customer acceptance of the hardware, and can be used as a starting point for developing an end application.

FMC/FMC+

VadaTech offers VITA 57 and VITA 57.4 compatible FMCs providing ADC, DAC, RF transceivers and network interfaces. These FMCs are widely deployed in commercial and mil/aero form factors. Please contact VadaTech Sales for more information.

RF End

The module has a dual channel ADC and dual channel DAC. The PCI596 utilizes TI ADC12DJ3200 ADC (option for ADC12DJ2700) providing 12-bit conversion rates of up to 6.4 GSPS and a DAC AD9164 (option for AD9162) providing 16-bit conversion rates of up to 12 GSPS. The ADC in non-interleaving mode can have two separate inputs each at 3.2 GSPS. The analog input/output, clock and trigger interfaces are routed via SMPM connectors via the rear of the module. The internal clock frequency is programmable and the clock is capable of locking to an external reference. The module has two inputs to be configured as trigger input and one trig output. Further the ADC TMSTP signal input source could be configured to come from the FPGA or the Trigger In. The rear RF I/O and trig in/out is via SMPM connectors.

Block Diagram

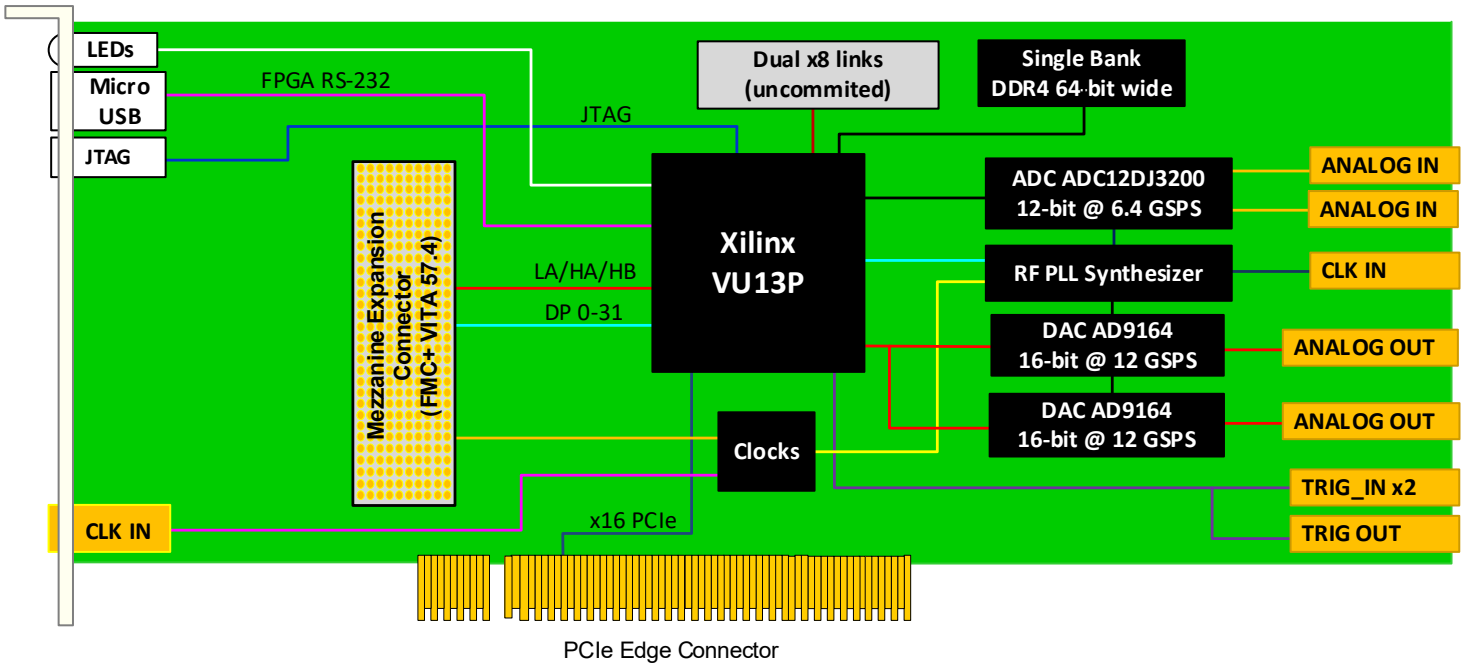

Figure 4: PCI596 Functional Block Diagram

Specifications

Architecture		
Physical	**Dimensions**	Double Module
		Width: 4.36” (110.74 mm)
		Depth: 11.34” (288 mm)
Type	**PCI Carrier**	PCI FPGA Carrier for FMC+ and RF
Standards		
PCIe	**Lanes**	X16
Configuration		
Power	**PCI596**	90W (FPGA Load dependent and without the FMC+ module)
Environmental	**Temperature**	See Ordering Options
		Storage Temperature: –40° to +85°C
	Vibration	Operating 9.8 m/s^2 (1G), 5 to 500 Hz
	Shock	30Gs on each axis
	Relative Humidity	5 to 95% non-condensing
Front Panel	**Interface Connectors**	Micro HDMI for FPGA JTAG
		FPGA JTAG via Micro HDMI
		FPGA RS-232 via Micro USB
		CLK IN from SSMC and SMPM via rear
	LEDs	Four Status and Four User defined
Software Support	**Operating System**	N/A
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 ISO9001:2000 and AS9100B:2004 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

PCI596 – ABC-0E0-0HJ

A = DDR4 Memory		
0 = No Memory 1 = 8 GB 2 = 16 GB*		
B = ADC	**E = FPGA Speed**	**H = Temperature Range**
0 = No ADC 1 = ADC12DJ3200 (6.4 GSPS) 2 = ADC12DJ2700 (5.4 GSPS) 3 = Reserved	1 = High (-2)* 2 = High (-2LE) 3 = Highest (-3E)*	0 = Commercial (–5° to +50°C) 1 = Industrial (–20° to +65°C)
C = DAC		**J = Conformal Coating**
0 = No DAC 1 = AD9164 (single DAC) 2 = AD9164 (dual DAC) 3 = AD9162 (single DAC) 4 = AD9162 (dual DAC)		0 = No coating 1 = Humiseal 1A33 Polyurethane 2 = Humiseal 1B31 Acrylic

Notes: *Minimum order quantity applies for these FPGA SKU's and/or memory option

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.

Related Products

AMC592

- AMC FPGA carrier for FMC per VITA 57
- Xilinx UltraScale™ XCKU115 FPGA
- Supported by DAQ Series™ data acquisition software

FMC223

- FPGA Mezzanine Card (FMC) per VITA 57
- Single module DAC 14-bit @ 2.5 GSPS (AD9739)
- 2 Vpp differential Analog output swing

FMC229

- FMC per VITA 57
- Quad DAC based on DAC39J84
- On-board dual Wideband Quadrature Modulator

Contact

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