

# VPX518

FPGA FMC Carrier, 3U VPX,  
Zynq-7000



VPX518

## Key Features

- 3U FPGA carrier for FPGA Mezzanine Card (FMC) per VITA-46 and VITA-57
- Xilinx Zynq-7000 FPGA in FFG-900 package (XC7Z100 or XC7Z045)
- High-performance clock jitter cleaner
- Protocols such as PCIe, SRIO, 10GbE/40GbE, etc. are
- FPGA programmable
- Compatible with VadaTech and 3rd-party FMCs

## Benefits

- Reference design with VHDL source code speeds application development
- Full system supply from industry leader
- AS9100 and ISO9001 certified company



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# VPX518

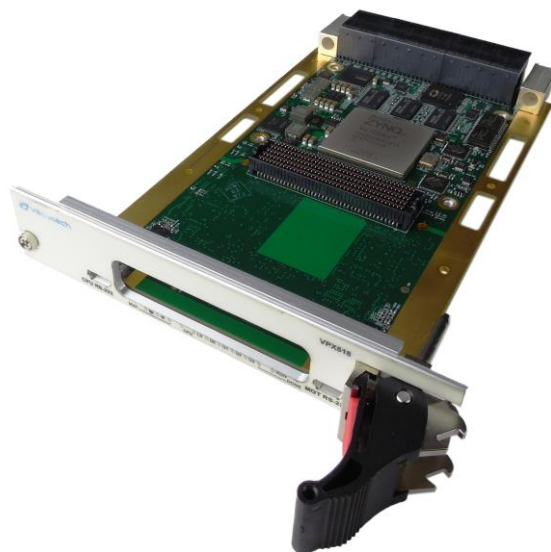
The VPX518 is a FPGA Carrier (VITA-46) with an FMC (VITA 57) interface. The unit has an on-board, re-configurable FPGA which interfaces directly to the FMC DP0-9 and all FMC LA/HA/HB pairs.

The FPGA has a single bank of 2GB DDR3 memory (64-bit wide). This allows for large buffer sizes to be stored during processing as well as for queuing the data to the host. The FPGA package includes an integrated SoC processor. The processor has a separate single bank of DDR3 (32-bit wide).

The module supports dual GbE and, dependent on FPGA code loaded, PCIe up to Gen3 (dual x4 or x8 lane), or dual SRIO, 10GbE or 40GbE on P1. There are 16 single ended lanes routed from the FPGA to P2.

The unit is available in a range of temperature and shock/vib specifications per ANSI/VITA-47, up to V3 and OS2.

Please contact VadaTech for details of Conduction Cooled versions.



# Block Diagram

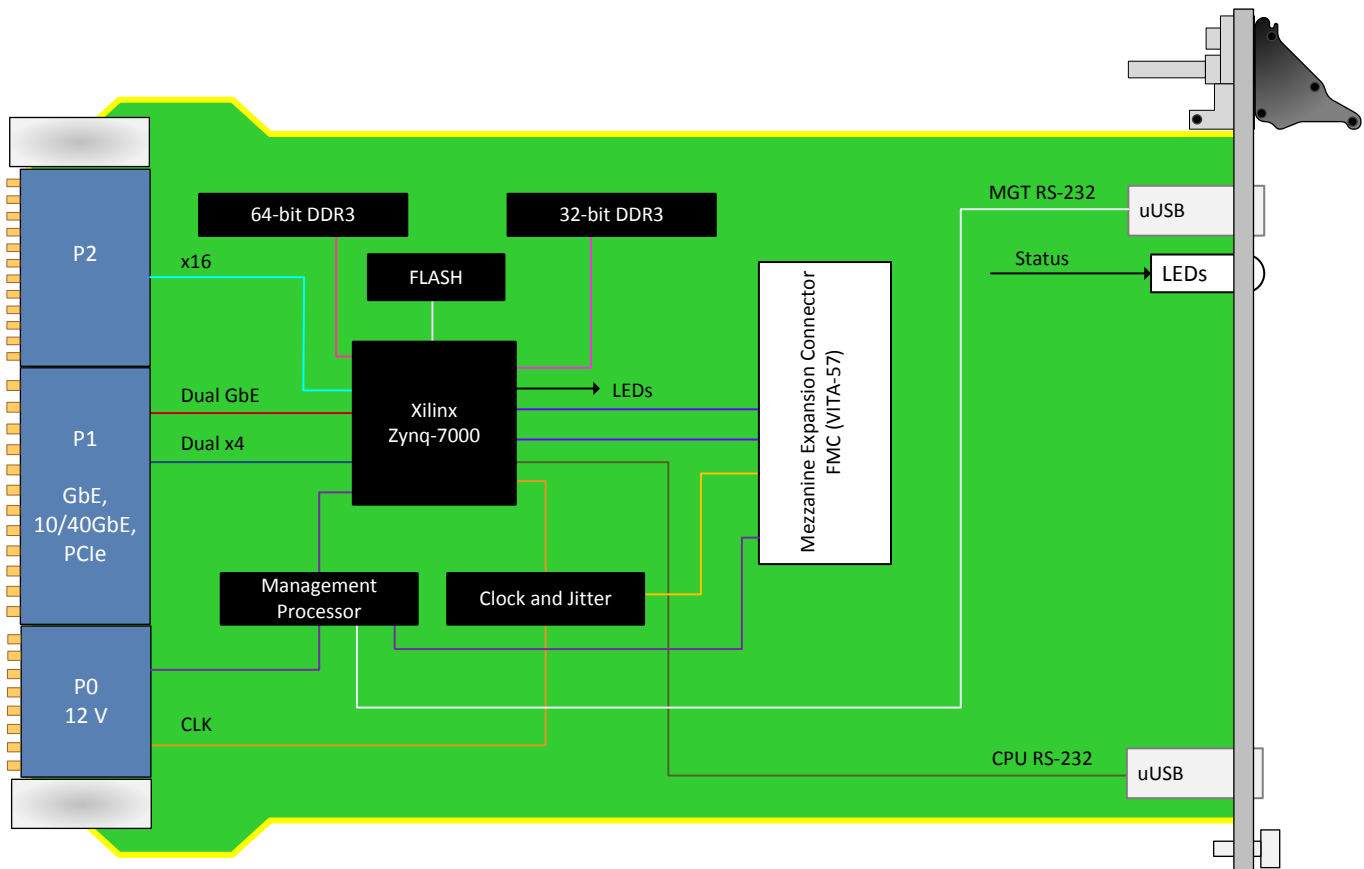


Figure 1: Functional Block Diagram

## Front panel

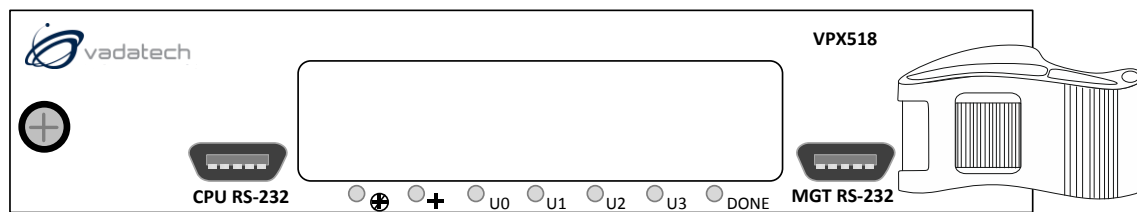


Figure 2: Front Panel

# 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 customer support site along with the reference images.

## Supported Software

- Default FPGA image stored in flash memory
- 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 tool for developing Digital Signal Processing (DSP) applications.

[Xilinx Vivado Design Suite](#), [Xilinx System Generator for DSP](#)

# Specifications

<b>Architecture</b>	
<b>Physical</b>	<b>Dimensions</b> 3U, 1" pitch
<b>Configuration</b>	
<b>Power</b>	~TBD W (dependent on FPGA load and FMC)
<b>Front Panel</b>	<b>FMC</b> Single FMC slot
	<b>Micro USB</b> RS-232 from Health Management and RS-232 from FPGA
	<b>LEDs</b> User defined by the FPGA and Health Management
<b>On-board Interfaces</b>	
<b>VPX Interfaces</b>	<b>Slot Profiles</b> See ordering options
	<b>Rear IO</b> Dual x4 fabric on P1 (PCIe Gen3 /10GbE/40GbE/ SRIO per FPGA load)
	Dual GbE on P1 x16 single ended lanes to P2
<b>Power Supplies</b> On P0: VS1 = 12 V	
<b>Other</b>	
<b>MTBF</b>	MIL Hand book 217-F@ TBD hrs
<b>Certifications</b>	Designed to meet FCC, CE and UL certifications, where applicable
<b>Standards</b>	VadaTech is certified to both the ISO9001:2000 and AS9100B:2004 standards
<b>Warranty</b>	Two (2) years

## INTEGRATION SERVICES AND APPLICATION-READY PLATFORMS

VadaTech has a full ecosystem of ATCA and  $\mu$ TCA products including chassis platforms, shelf managers, AMC modules, Switch and Payload Boards, Rear Transition Modules (RTM), 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

## VPX518– A0C-DEF-GHJ

A = FPGA DDR3 Memory	D = FPGA Speed	G = Applicable Slot Profiles
0 = None 1 = Reserved 2 = 2 GB	1 = Reserved 2 = High 3 = Highest	0 = 5 HP
E = Clock Holdover Stability		H = Environmental
0 = Standard (XO) 1 = Stratum-3 (TCXO)		See Environmental Specification table option H description
C = FPGA	F = PCIe Option (P1) for Data Port 1/2	J = Conformal Coating
0 = Reserved 1 = XC7Z045 2 = XC7Z100	0 = None 1 = PCIe / None 2 = None / PCIe 3 = PCIe / PCIe	0 = None 1 = Humiseal 1A33 Polyurethane 2 = Humiseal 1B31 Acrylic

## 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

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

## Related Products

### FMC150



- FPGA Mezzanine Card (FMC) per VITA-57
- Single-module
- Input for 1PPS, 10 MHz or IRIG-B

### FMC222



- FPGA Mezzanine Card (FMC) per VITA-57
- Single module
- Dual AD9739 DAC 14-bit at 2.5 GSPS

### FMC228



- Quad ADC based on AD9234 (1 GSPS or 500 MSPS)
- Option for Direct RF sampling clock via front panel
- Supported by DAQ Series™ data acquisition software

# Contact

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- Partnerships power innovation
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- Mutual success

## We deliver complexity

- Complete signal chain
- System management
- Configurable solutions

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- Agile production
- Accelerated deployment
- AS9100 accredited



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