

VPX105

Most Comprehensive PCIe Gen3 Switch with Dual PMC/XMC for 6U VPX Systems



VPX105

Key Features

- 6U VPX module VITA 46.0
- 64 Port PCIe switch Fabric
- Support for dual PMC/XMC modules
- Single or Dual PCIe Gen3 x16 to P1/P2 (option load)
- Bifurcation of the x16 lanes to dual x8 or quad x4 (or any other combination)
- PCIe x8 to each XMC
- Comprehensive user I/O routing options per VITA 46.9
- Four PCIe virtual domain configuration
- Dual PMC/XMC user I/O per VITA 46.9
- The XMC connector option with VITA 42.0 or VITA 61.0
- Health Management through dedicated Processor

Benefits

- High bandwidth to each XMC
- Standard I/O interface to backplane
- Standard flexible connectivity to backplane
- Virtual domain capability
- Design utilizes proven VadaTech subcomponents and engineering techniques
- Electrical, mechanical, software, and system-level expertise in house
- Full system supply from industry leader
- AS9100 and ISO9001 certified company

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VPX105

The VPX105 is a carrier module (VITA 46) for general purpose XMC/PMC that integrates I/O or processing COTS XMC/PMC modules into a VPX data processing system.

The onboard PCIe Gen3 switch supports XMC high bandwidth data throughput. The module routes 16 lanes of PCIe Gen3 to both P1 and P2, or either one of them, by ordering option. The configuration allows routing and segregation of the XMC/PMCs by configuring the switch to dual Virtual PCIe domain or to single PCIe domain. This configuration is done once by the user, to setup PCIe virtual domains for multi-root-complex system architectures, and is persistent across system boot. Each backplane x16 lane is configurable by software to dual x8 or quad x4 lanes (or any other combination such as single x8 plus dual x4).

The PMC sites with onboard PCI-X to PCIe bridge supports 64-bit PCI-X @133 MHz. J4 I/O signals are routed to the P3/P4 or P5/P6 connectors per VITA 46.9.

The XMC site can be supplied with VITA 42.0 or VITA 61.0 interface connectors.

The J14/J16 connectors of the XMC are routed per VITA 46.9. The module supports different backplane pin field assignments to enable rear I/O access for the XMC module. The following profiles are supported:

- P3w1-P64s (XMC site 1)
 - o P5W1-P64s (XMC site 2)
- P3w1-P64s+P4w1-X12 (XMC site 1)
 - o P5w1-P64s+P4w1-X12 (XMC site 2)
- P3w1-P64s+P4w1-X12d+X8d (XMC site 1)
 - o P5w1-P64s+P6w1-X12d+X8d (XMC site 2)
- P3w3-X38s+X8d+P4w1-X12d (XMC site 1)
 - o P5w3-X38s+X8d+P6w1+X12d (XMC site 2)
- P3w3-X38s+P4w1-X12d (XMC site 1)
 - o P5w3-X38s+P6w1-X12d (XMC site 2)
- P3w3-X38s+X8d+P4w1-X12d (XMC site 1)
 - o P5w3-X38s+X8d+P6w1-X12d (XMC site 2)
- P4w1-X12d (XMC site 1)
 - o P6w1-X12d (XMC site 2)
- P4w1-X12d+X8d (XMC site 1)
 - o P6w1-X12d+X8d (XMC site 2)

The unit is available in a range of temperature and shock/vibration specifications per ANSI/VITA 47. Refer to ordering options.

The module has front JTAG port as well as JTAG routed to P0. The JTAG is routed to each XMC and/or PMC module if XMC/PMC modules are present on the carrier. This provide access to the full JTAG chain route.

The VPX105, in addition to having dual XMC/PMC, could be utilized as the PCIe Gen3 switch in the overall system architecture. The module supports up to four PCIe Virtual domains (allowing four hosts in the system).

The health management can monitor the sensors of each XMC module.

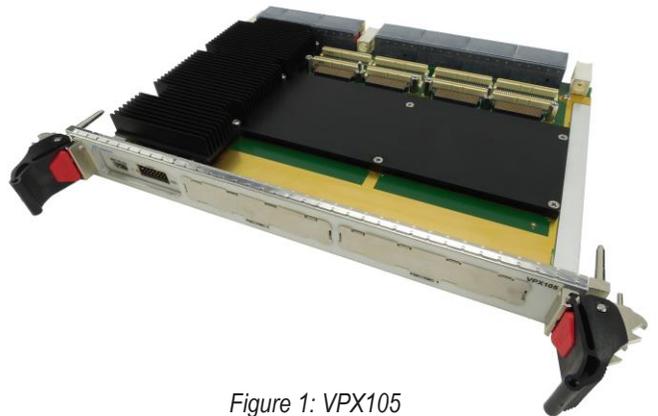


Figure 1: VPX105

Block Diagram

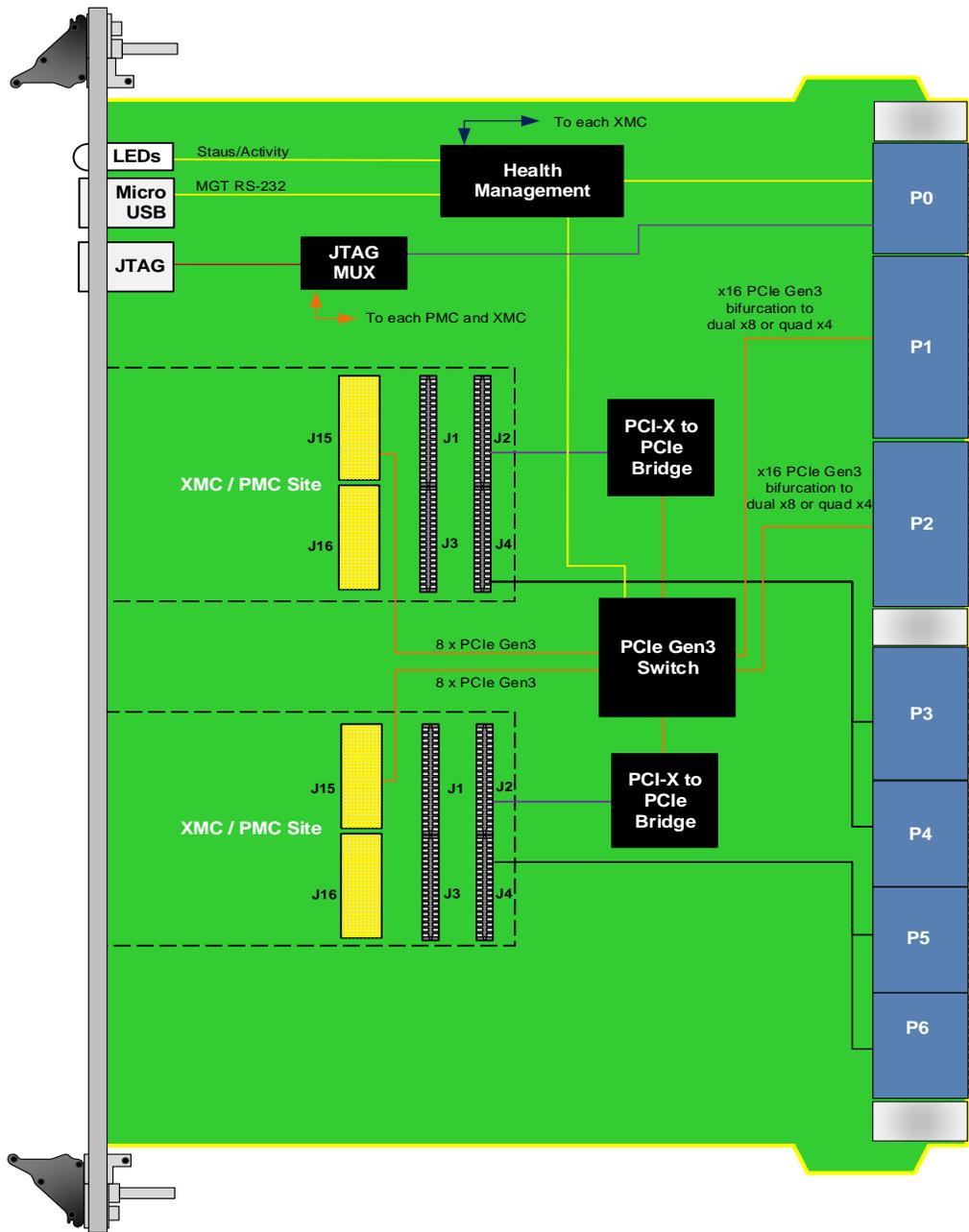


Figure 2: VPX105 Functional Block Diagram

Front Panel

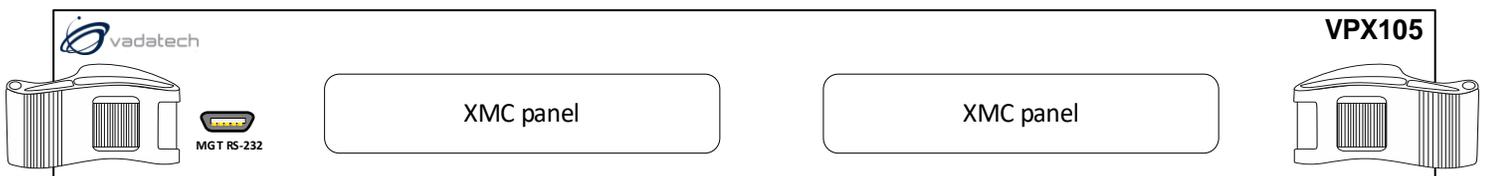


Figure 3: VPX105 Front Panel

Use Case Examples

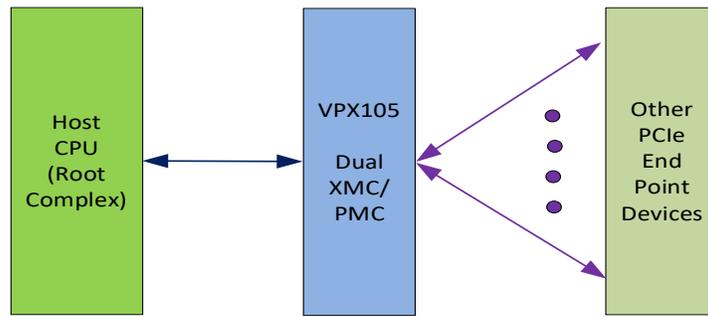


Figure 3: Example of use case with single Host

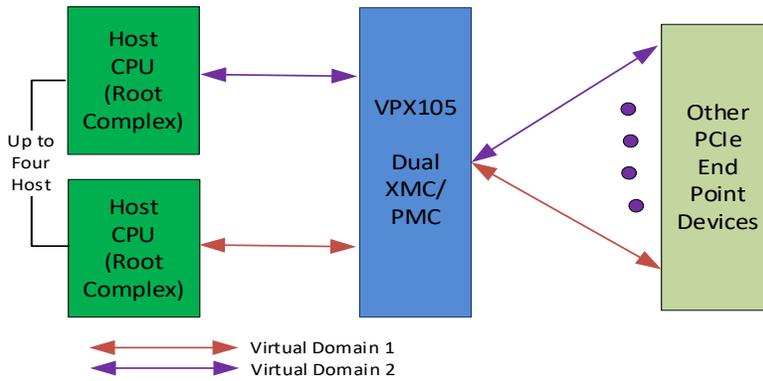


Figure 4: Example of use case with Multi Host

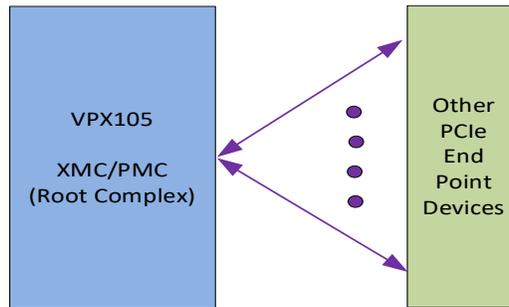


Figure 5: Example of use case with XMC/PMC as Host

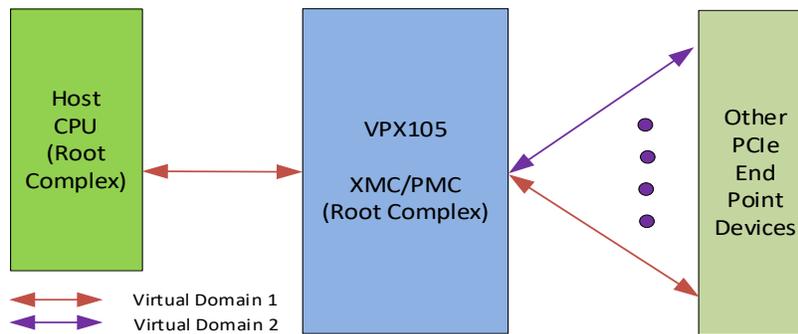


Figure 6: Example of use case with XMC/PMC as Host as well as another Host

Specifications

Architecture		
Physical	Dimensions	6U, 1" pitch (for air-cooled version)
Configuration		
Power	VPX105	20w (Application specific) without the XMC/PMC installed
Bridge	PCIe	Gen3 switch 64 lanes
Front Panel	XMC/PMC	Dual XMC/PMC front panels sites for convection cool
	Micro USB	RS-232 for Health Management
	LEDs	User defined by Health Management
Onboard Interfaces		Dual PMC/XMC site
VPX Interfaces	Slot Profiles	See Ordering Options
	Rear IO	16x PCIe Gen3 (to each of P1 and P2) User I/O J4 to P3/P4 and P5/P6 (VITA 46.9)
	Power Supplies	On P0: VS1 = +12V, +5V
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

VPX105 – ABC-DEF-GHJ

A = XMC VPWR** 0 = +12V 1 = +5V	D = XMC/PMC Mezzanine Height⁺ 0 = 10 mm 1 = 12 mm	G = Applicable Slot Profiles 0 = 5 HP, VITA 48.1 1 = Reserved
B = VITA 46.9 Pin Fields (P3/P4 and P5/P6)*** 0 = P3w1-P64s; P5w1-P64s 1 = P3w1-P64s+P4w1-X12d; P5w1-P64s+P6w1-X12d 2 = P3w1-P64s+P4w1-X12d+X8d; P5w1-P64s+P6w1-X12d+X8d 3 = P3w3-X38s+X8d+P4w1-X12d; P5w3-X38s+X8d+P6w1-X12d 4 = P3w3-X38s+P4w1-X12d; P5w3-X38s+P6w1-X12d 5 = P3w3-X38s+P4w1-X12d+X8d 6 = P4w1-X12d; P6w1-X12d 7 = P4w1-X12d+X8d; P6w1-X12d+X8d 8 = Reserved 9 = Reserved	E = VPX Connector Type 0 = Standard 50u Gold Rugged 1 = KVPX Connectors	H = Environmental See Environmental Specification
C = XMC Connectors 0 = VITA 42 1 = VITA 61	F = PCIe x16 Placement* 0 = P1 and P2 to PCIe switch 1 = P1 only to PCIe switch 2 = P2 only to PCIe switch	J = Conformal Coating 0 = No coating 1 = Humiseal 1A33 Polyurethane 2 = Humiseal 1B31 Acrylic

Notes:

* Please contact VadaTech Sales if PCIe x4 and/or x8 is needed vs x16.

** Per VITA specification the XMC VPWR can be powered from +5V or +12V. Please consult the XMC module that will be used.

*** Note the pin fields are the same for P3/P4 and P5/P6, what is shown if for P3/P4. Contact VadaTech sales for other options.

⁺ VadaTech recommends for non-conduction cool XMC/PMC the height to be 12mm so the XMC/PMC has better cooling

Environmental Specification

Option H	Air Cooled			Conduction Cooled	
	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).

Related Products

VPX007



- Versatile Layer 2 managed Ethernet switch
- Total of 24 Ports of 10GbE
- VITA 46 and VITA 65 compliant

VPX550



- Xilinx Kintex UltraScale™ XCKU115 FPGA provides 5,520 DSP slices for complex processing
- COM Express Module Type-6
- CFAST socket for removable storage

VPX551



- Dual Kintex UltraScale™ XCKU115
- Rear fibre I/O via VITA 66.5
- Front fibre via SFP+

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