PXIe XMC x8 Lane Adapter

Innovative Integration ... real time solutions!

Adapts PCIe XMC to PXI Express with P16 High Speed Communications Ports and Digital IO

V1.01

FEATURES

- Adapt one XMC PCI Express VITA 42.3 module to a PXI Express slot
- Supports up to 8 lanes, PCIe gen3
- Transparent Operation
- Eight high speed expansion lanes from XMC P16 using dual QSFP connectors
- 8 differential pairs routed from P16 to high-speed, front panel Samtec connector
- IEEE 1384 XMC mechanicals
- >50W power provided to the module
- Robust end bracket
- Fan provides 19 CFM air flow
- Thermal plane and conductive rails improve module cooling
- Consumes two contiguous PXIe slots
- Supports newest XMC card generation which provides 5 GHz analog I/O & use of the Kintex XCKU060/XCKU085 Ultrascale FPGA

APPLICATIONS

- Add XMC modules to standard PXIe host systems
- System expansion using high speed serial links

SOFTWARE

- No software required

DESCRIPTION

The PXI Express to XMC module adapter allows a standard 75 x 150mm PCIe XMC module to be used in a PXI Express slot. The XMC module must be VITA 42.3-compatible and may support up to eight PCI Express lanes. The adapter is completely transparent to PCI Express. All PCIe bus signals from the PXI Express host bus are connected directly to the XMC module. The PXIe adapter can be utilized with InnovativeInnovative XMC cards including our newest generation models which provide 5 GHz analog I/O and use the Kintex XCKU060/XCKU085 Ultrascale FPGA.

The XMC P16 connector is routed to QSFP connectors for high speed signals at speeds up to 6 GHz. The connectors provide a simple way to “patch-panel” communications links between cards.

The XMC P16 connector also routes differential matched-length pairs to a high-performance Samtec connector in the slot adjacent to the XMC module. Special support for trigger and timing inputs to Innovative XMC modules is provided through their front-panel SMA/SMMC connectors or PXIe backplane differential signals.

Conduction cooling using VITA20 standard, as well as an optional fan, provide cooling to the XMC module.

The XMC module mounts securely to the adapter using standoffs and with the end bracket. The bracket mates to standard PMC end brackets and supports an EMI gasket.

06/10/16

PXIe XMC x8 Lane Adapter

This electronics assembly can be damaged by ESD. Innovative Integration recommends that all electronic assemblies and components circuits be handled with appropriate precautions. Failure to observe proper handling and installation procedures can cause damage.

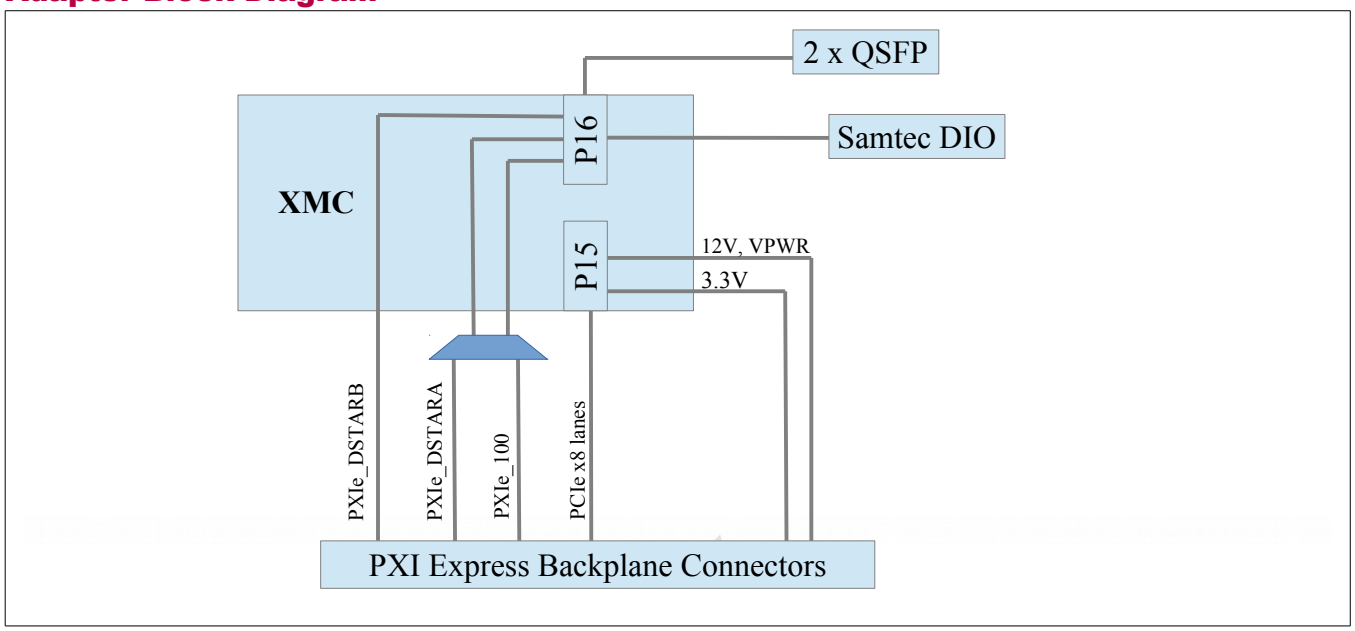
ESD damage can range from subtle performance degradation to complete device failure. Precision integrated circuits may be more susceptible to damage because very small parametric changes could cause the device not to meet its published specifications.

ORDERING INFORMATION

Product	Part Number	Description
PXIe-XMC Adapter with I/O expansion for X6 modules	80341-1	PXIe XMC x8 Lane Adapter for Innovative X6-series XMC modules, 3U 8HP (Fan unit w/QSFP and DIO)
PXIe-XMC Adapter with I/O expansion for X3 modules	80341-2	PXIe XMC x8 Lane Adapter for Innovative X3-series XMC modules, 3U 8HP (Fan unit and DIO)

PXIe XMC x8 Lane Adapter

Adapter Block Diagram



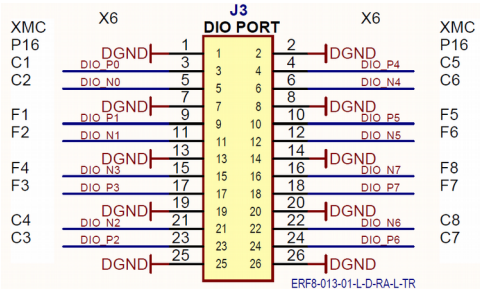
PXIe XMC x8 Lane Adapter

Physicals	
Form Factor	PXI Express 3U, dual-slot
Size	3.72 in x 8.05 in
Weight	100g

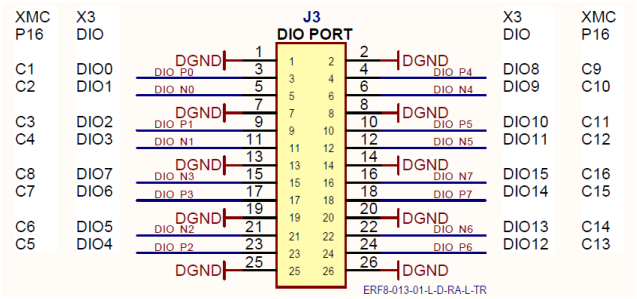
Power Capability Delivered to the XMC (from backplane)	
Volts	Amps
3.3V	6A Maximum
5V	Not provided to XMC
+12V	4A Maximum, to +12V & VPWR
-12V	Not provided to XMC

** XMC cooling may be required

DIO Signal Mapping for X6 family



DIO Signal Mapping for X3 family



J3 – Front Panel Connector for XMC DIO

DIO Signals are routed as 8 differential pairs. Pairs are 50 ohm, 100 ohm differential characteristic impedance, suitable for LVDS or LVPECL. These signals can also be used as single ended LVCMOS or LVTTL according to the configuration of the XMC module.

Connector:

Samtec ERF8-013-01-L-D-RA-L-TR

Mating cables:

Samtec ERCD-013 series or equivalent (coax ribbon type for single ended signals)

Samtec ERDP-013 series or equivalent (twinax ribbon type for differential signals)

PXIe XMC x8 Lane Adapter

High Speed QSFP Connectors

XMC High Speed Serial Pair	XMC P16 Pins (P/N)	QSFP Connectors (0 and 1)
TXP0/N0	A1/B1	0: TXP0/N0
TXP1/N1	D1/E1	0: TXP1/N1
TXP2/N2	A3/B3	0: TXP2/N2
TXP3/N3	D3/E3	0: TXP3/N3
TXP4/N4	A5/B5	1: TXP0/N0
TXP5/N5	D5/E5	1: TXP1/N1
TXP6/N6	A7/B7	1: TXP2/N2
TXP7/N7	D7/E7	1: TXP3/N3
RXP0/N0	A11/B11	0: RXP0/N0
RXP1/N1	D11/E11	0: RXP1/N1
RXP2/N2	A13/B13	0: RXP2/N2
RXP3/N3	D13/E13	0: RXP3/N3
RXP4/N4	A15/B15	1: RXP0/N0
RXP5/N5	D15/E15	1: RXP1/N1
RXP6/N6	A17/B17	1: RXP2/N2
RXP7/N7	D17/E17	1: RXP3/N3

PXIe XMC x8 Lane Adapter

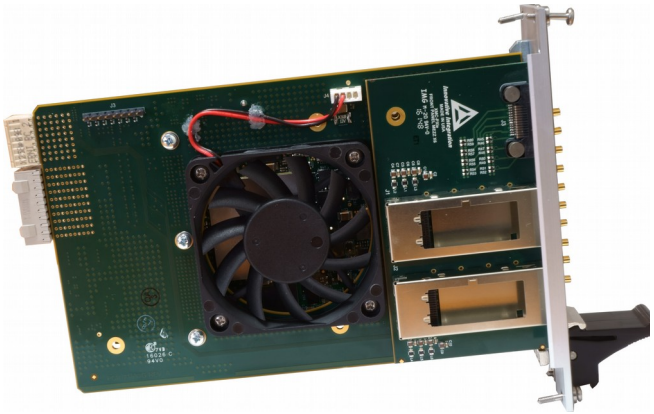


Illustration 1: Back of adapter illustrating cooling fan

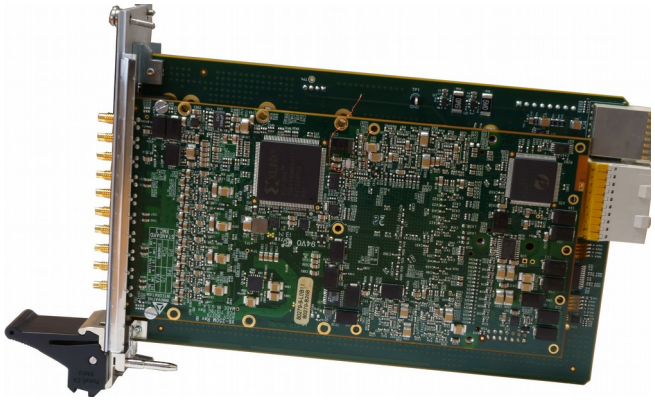


Illustration 2: Front of adapter illustrating mounted XMC module

Applications Information

High Speed Serial Communications
The adapter card has 8 high speed serial lanes from the XMC card via P16 supporting Gigabit serial ports for intercard communications or expansion. The serial lanes connect directly to QSFP connectors. Standard QSFP cables can be used to connect multiple cards together to create high speed, dedicated communications channels between XMC modules. On Innovative's X5, X6 and XU modules, these are multi-gigabit ports directly from the XMC Virtex FPGA.

Digital IO
Digital IO from XMC P16 is directly mapped to the Samtec connector on the Adapter front panel. There are 8 differential pairs (100 ohm) with matched length. A mating cable suitable for high-speed differential pairs is available (see ordering information).

Cooling the XMC Module
Many XMC modules require special considerations to provide adequate cooling. Monitor XMC module device temperatures and add convective air flow if required to maintain within rated thermal limits.

The module provides conduction cooling using on-card heat sink and a dedicated thermal plane. The conduction cooling conforms to VITA20 specification for PMC/XMC module cooling. When a compatible module is used with the card, the thermal plane effectively conducts heat from the module to the carrier card and front bracket. System cooling is therefore more effective because o f the heat spreading from the module to the carrier card.

A fan is included on the PXIe-XMC adapter for cooling. The fan provides approximately 19 CFM air flow. When the fan is installed, it blows air directly on the module and is very effective. The fan protrudes 10mm from the back of the card and

does consume the adjacent slot in the PXIe chassis. Hence, the adapter is said to consume two PXIe slots.

Module Mounting Hardware
The module can be securely mounted to the adapter for both conduction cooling and ruggedness. Two 10mm female threaded standoffs are used to secure the module to the adapter. If conduction cooling is used, cooling bars are secured to the card and the module using 2.5 mm screws. This hardware can be purchased from Innovative Integration.

Software Driver
No software is required.

PXIe XMC x8 Lane Adapter

IMPORTANT NOTICES

Innovative Integration Incorporated reserves the right to make corrections, modifications, enhancements, improvements, and other changes to its products and services at any time and to discontinue any product or service without notice. Customers should obtain the latest relevant information before placing orders and should verify that such information is current and complete. All products are sold subject to Innovative Integration's terms and conditions of sale supplied at the time of order acknowledgment.

Innovative Integration warrants performance of its hardware products to the specifications applicable at the time of sale in accordance with Innovative Integration's standard warranty. Testing and other quality control techniques are used to the extent Innovative Integration deems necessary to support this warranty. Except where mandated by government requirements, testing of all parameters of each product is not necessarily performed.

Innovative Integration assumes no liability for applications assistance or customer product design. Customers are responsible for their products and applications using Innovative Integration products. To minimize the risks associated with customer products and applications, customers should provide adequate design and operating safeguards.

Innovative Integration does not warrant or represent that any license, either express or implied, is granted under any Innovative Integration patent right, copyright, mask work right, or other Innovative Integration intellectual property right relating to any combination, machine, or process in which Innovative Integration products or services are used. Information published by Innovative Integration regarding third-party products or services does not constitute a license from Innovative Integration to use such products or services or a warranty or endorsement thereof. Use of such information may require a license from a third party under the patents or other intellectual property of the third party, or a license from Innovative Integration under the patents or other intellectual property of Innovative Integration.

Reproduction of information in Innovative Integration data sheets is permissible only if reproduction is without alteration and is accompanied by all associated warranties, conditions, limitations, and notices. Reproduction of this information with alteration is an unfair and deceptive business practice.

Innovative Integration is not responsible or liable for such altered documentation. Resale of Innovative Integration products or services with statements different from or beyond the parameters stated by Innovative Integration for that product or service voids all express and any implied warranties for the associated Innovative Integration product or service and is an unfair and deceptive business practice. Innovative Integration is not responsible or liable for any such statements.

For further information on Innovative Integration products and support see our web site:

www.innovative-dsp.com

Mailing Address: Innovative Integration, Inc.

741 Flynn Rd, Camarillo, CA 93012