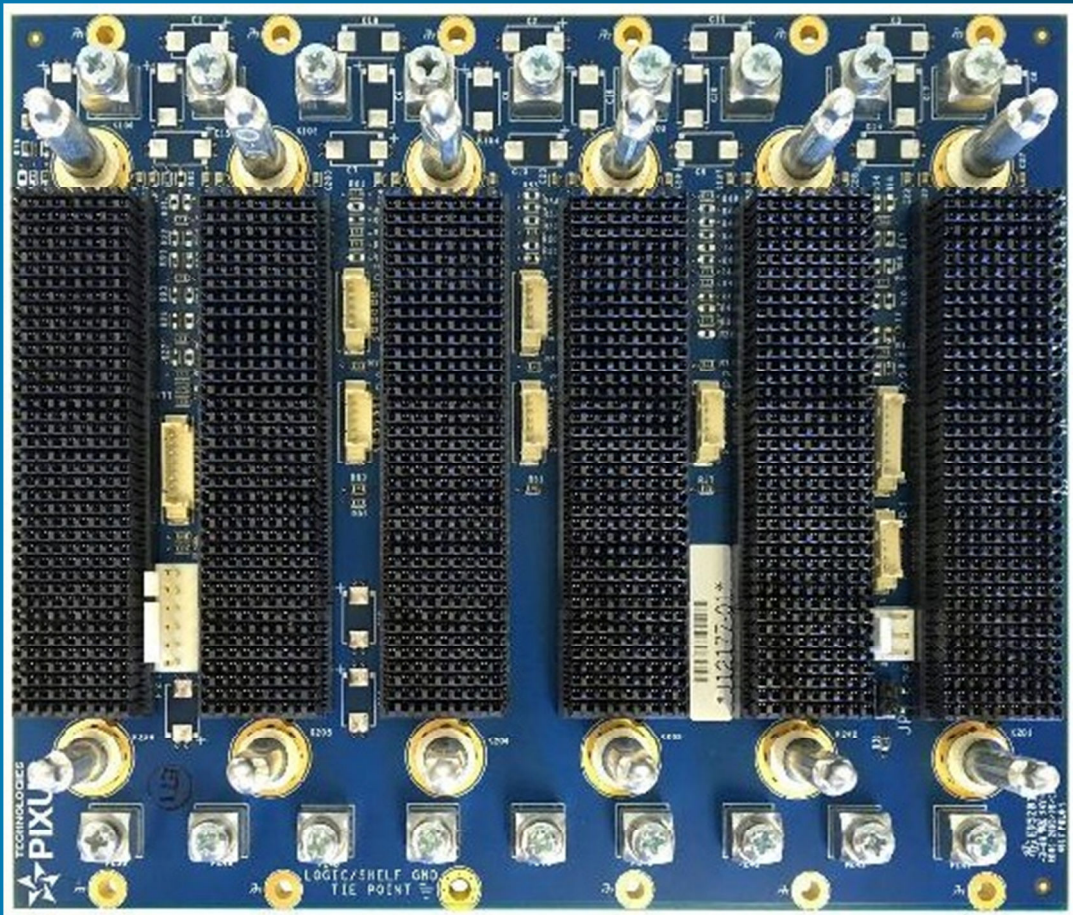


USER GUIDE



3U VPX 6-SLOT
BKP3-CEN06-15.2.2-1+

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TYPOGRAPHICAL CONVENTIONS USED IN THIS DOCUMENT

Items	Convention
You will see the following icons periodically throughout this manual:	
	The WARNING icon cautions you against an action or treatment that could threaten the responsiveness of the equipment or the integrity of your current work.
	The INSPECT icon alerts the reader to follow inspection instructions to ensure product is not damaged and in operational order.
	The NOTE icon notifies you of the information that makes a procedure easier or clarifies an earlier description.
Headings, titles, sections or words of importance.	These items appear in bold typeface. Example: Any changes or modifications.....
Variable placeholders, references to other documents, new or special terminology, and emphasis.	These items appear in <i>italic</i> typeface. Example: <i>Table 3-1, displays.....</i>
References to chapters and sections of documents, and citations of messages displayed to users.	These items appear in “quotation marks.” Example: For more information, refer to “Connections”, section 3....

Revision History

Revision	Date	Description	Author
1.0	6-Sept-2019	Released for product approvals	J. Houde

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SECTION ONE

1. INTRODUCTION

This section provides a brief overview about Pixus Technologies Inc. This section describes the following:

- 1.1 Pixus Technologies Inc.
- 1.2 Contact Information
- 1.3 Background Information
- 1.4 Applicability

1.1. PIXUS TECHNOLOGIES INC.

Pixus Technologies specializes in the design and manufacture of electronic packaging solutions for the global embedded computer market. The company is comprised of three business units: backplanes, Enclosure & System Solutions and Components.

Leveraging over 20 years of innovative product development, Pixus Technologies' embedded backplanes and systems are focused primarily on xTCA, OpenVPX, CompactPCI, PCIe and custom designs. The company offers unsurpassed thermal management solutions, creative design innovations, and backplane design expertise. Pixus also offers modular 19" rackmount enclosure solutions and instrument cases to a wide range of industries, as well as precision components such as front panels, handles, and card guides.

The approach to each customer requirement is a simple consultative philosophy - understand the specific program requirements and create the best solution that meets the time frame, architecture, technology and cost objectives.

1.2. CONTACT INFORMATION

For questions about the Pixus product or about Pixus in general, please contact us using the following information:

Phone Number: (519) 885-5775
Fax Number: (226) 444-0225
Web Address: www.pixustechnologies.com
Mailing Address: Pixus Technologies Inc.
50 Bathurst Drive, Unit 6
Waterloo, Ontario
Canada
N2V 2C5

For Pixus product support, see the Pixus web site: www.pixustechnologies.com

1.3. BACKGROUND INFORMATION

When designing OpenVPX® systems, use the following documents for reference:

- ANSI/VITA® 62.0 Modular Power Supply Standard
- ANSI/VITA® 48.0 Mechanical Specification for Microcomputers Using Ruggedized Enhanced Design Implementation (REDI)
- ANSI/VITA® 48.1 Mechanical Specification for Microcomputers Using REDI Air Cooling
- ANSI/VITA® 46.0-2007 VPX Baseline Standard
- ANSI/VITA® 46.1-2007 VMEbus Signal Mapping on VPX
- ANSI/VITA® 46.3-2012 Serial RapidIO® on VPX Fabric Connector
- ANSI/VITA® 46.4-2012 PCI Express® on VPX Fabric Connector
- ANSI/VITA® 46.6-2013 Gigabit Ethernet Control Plane on VPX
- ANSI/VITA® 46.7-2012 Ethernet on VPX Fabric Connector
- ANSI/VITA® 46.8-VDSTU Infiniband® on the VPX Fabric Connector
- ANSI/VITA® 46.9-2010 PMC/XMC Rear I/I Signal Mapping on 3U and 6U VPX Module
- ANSI/VITA® 46.10-2009 Rear Transition Module for VPX
- ANSI/VITA® 46.11-VDSTU System Management for VPX
- ANSI/VITA® 46.9 PMC/XMC Rear I/O Fabric Signal Mapping on 3U and 6U VPX Modules Standard
- ANSI/VITA® 65.0-2017 OpenVPX® System Standard
- ANSI/VITA® 65.1-2017 OpenVPX® System Standard – Profile Tables
- ANSI/VITA® 68.0-VDSTU VPX Compliance Channel
- ANSI/VITA® 68.1-VDSTU VPX Compliance Channel – Fixed Signal Integrity Budget
- RoHS 2011/65/EU

1.4. APPLICABILITY

This User Guide is applicable to the following model(s):

Model	Description
VPX30-06-BE-12A41-0	3U 6 Slot OpenVPX Backplane w RTM
VPX30-06-BE-12X41-0	3U 6 Slot OpenVPX Backplane w/o RTM
VPX30-06-BE-12C41-0	3U 6 Slot OpenVPX Backplane Custom RTM

Table 1-1: Applicability

SECTION TWO

2. FEATURES

The backplane has been designed with the following features:

- Support for 6 3U 5HP Modules.
- Conformance to VITA 65.x BKP3-CEN06-15.2.2-1+ profile.
- 8Gbps minimum signaling rate.
- ANSI/VITA® 65.0 and 65.1 compliant.
- Mechanical conformance to 157.16mm (6.067") x 128.7mm (5.06") x 5.4mm (0.213").
- Eighteen layer construction.
- Power elements for primary power input.
- Individual 5-pin headers for JTAG connectivity at each slot.
- Two 8-pin headers for access to the system management bus and control signals.
- Support for 6 RTMs.
- Switch slot conform to VITA 65.1 SLT3-SWH-6F6U-14.4.1 profile.
- Payload slots conform to VITA 65.1 SLT3-PAY-1F2F2U-14.2.2 profile.

Figure 2-1 illustrates the major features of the backplane, showing approximate locations for all connectors.

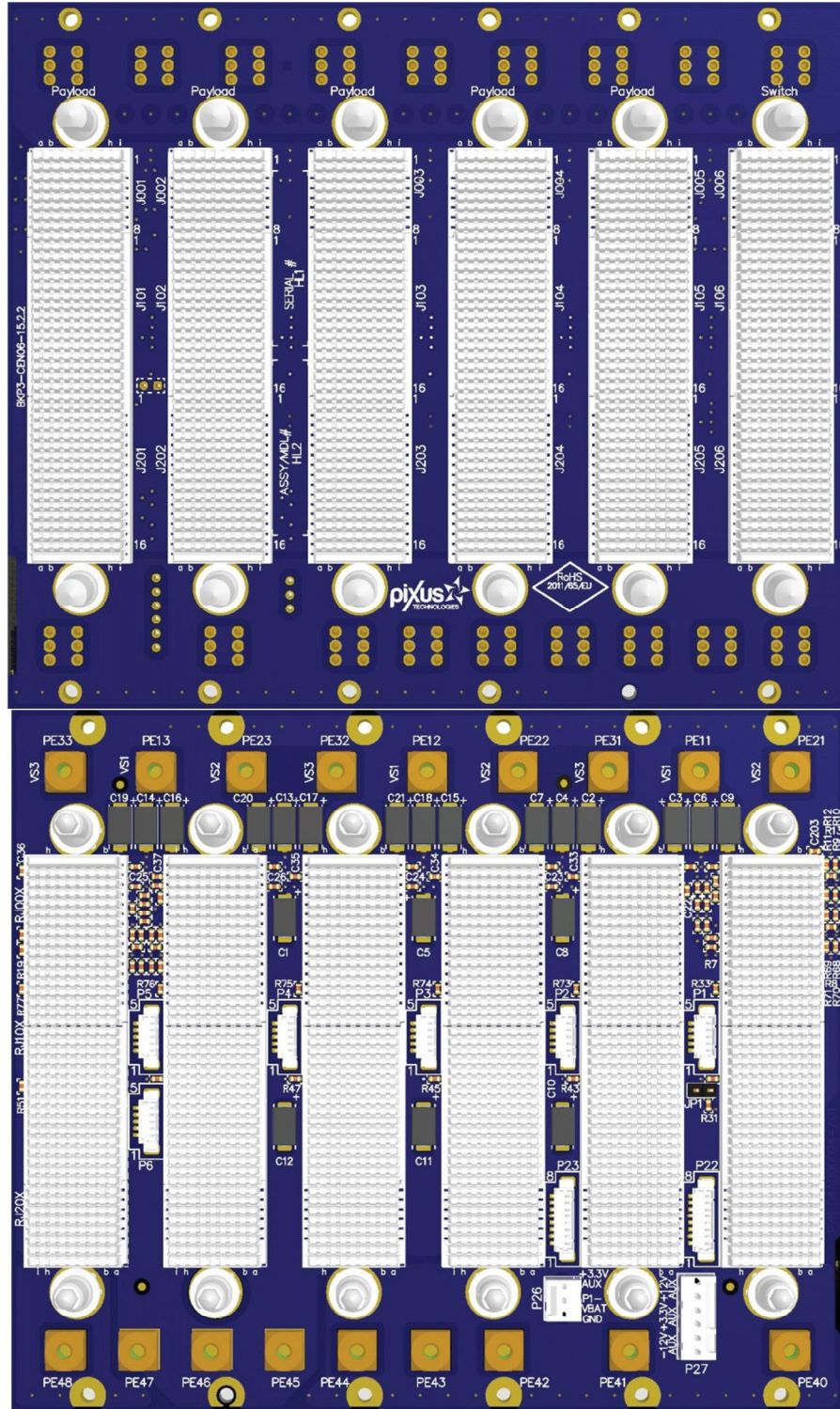


Figure 2-1: Connector Locations

SECTION THREE

3. QUICK START

The backplane complies with the VITA standards as they were when the backplane was created.

This chapter will provide an overview of basic operating procedures, including the following:

- Inspecting Your Backplane
- Installing Your Backplane In A Subrack
- Accessory Connections

3.1. INSPECTING YOUR BACKPLANE



Take great care when handling the backplane. Improper handling could cause damage to the connector pins.
Always handle the backplane from the edges, never the connectors.

The first item that must be done before starting to utilize your backplane is to perform a thorough inspection.

During the course of handling, shipping and assembly, pins, mounting screws and other items could become damaged and/or loose. Operating a damaged backplane could cause serious damage to the backplane and/or devices that interface to it.

Take a few minutes to visually inspect that all of the connector pins are straight, screws are tight, etc.

Repair any bent pins, loose screws, etc. before proceeding. If damage to the backplane is deemed too extensive, call Pixus Customer Service for assistance on how to proceed.

3.2. INSTALLING YOUR BACKPLANE IN A SUBRACK

The backplane mounts into a sub-rack using M2.5 screws along the rows of mounting holes situated at the top and bottom end of each slot, with all mounting holes connecting to chassis ground with the possible exception of one.

The mounting rail areas of the backplane have exposed strips of copper that are connected directly to the chassis ground of the backplane.



The backplane must be mounted in the sub-rack with insulator strips between it and the rails. Applications where conductive strips are utilized must be inspected to make sure there is no electrical contact between the rails and any device on the backplane.

As stated above, there is possibly one mounting screw that allows digital ground to be tied to chassis (frame) ground. The mounting hole that connects to digital ground is marked with the corresponding symbol ($\overline{\text{E}}$) on the bottom silkscreen.

The arrow in Figure 3-1 illustrates the screw location for the single ground tie point. Refer to the subrack user guide for information on torque limits for the mounting screws.

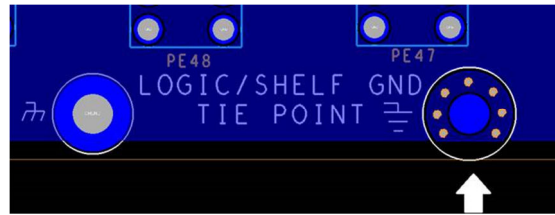


Figure 3-1: Digital Ground – Chassis Ground Tie Point

3.3. ACCESSORY CONNECTIONS

3.3.1. MISCELLANEOUS HEADERS

3.3.1.1. JTAG

Each slot has a 5 pin header (P[1-5]) to allow access to the slot's JTAG signals.

Refer to Table 5-2 for a suitable mating connector and wire crimps.

Table 3-1 displays the pinout for the JTAG headers along with the corresponding pin on the slot

Pin #	Signal	Backplane Pin
1	TRST_[1:6]	J0[01:6] a7
2	TMS_[1:6]	J0[01:6] b7
3	TDI_[1:6]	J0[01:6] e7
4	TDO_[1:6]	J0[01:5] f7
5	TCK_[1:6]	J0[01:5] i7

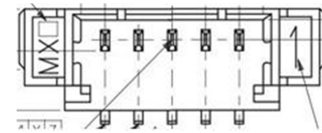


Table 3-1: JTAG Connectors

3.3.1.2. VBAT

One 3-pin header (P26) is supplied on the rear side for external connection to VBAT and 3.3V_AUX.

A standard 0.100" shunt is provided to connect VBAT to either GND or 3.3V_AUX. By default, the connection is to 3.3V_AUX.

Refer to Table 5-2 for a suitable mating connector and wire crimps for other applications.

Table 3-2 illustrates the pinout for the VBAT connector.

Pin #	Signal
1	GND
2	VBAT
3	3.3V_AUX

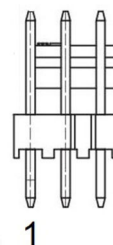


Table 3-2: VBAT Connector Pinout

3.3.1.3. System Management

There are two 8 pin headers (P22, P23) to allow access to the System Management signals.

Refer to Table 5-2 for a suitable mating connector and wire crimps.

Table 3-3 displays the pinout for the System Management headers.

Pin #	Signal (P22)	Signal (P23)
8	SM1	SM3
7	SM0	SM2
6	SYSRESET*	SYSRESET*
5	GND	GND
4	NVMRO	NVMRO
3	MSK_RST*	MSK_RST*
2	GND	GND
1	3.3V_AUX	3.3V_AUX

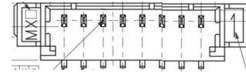


Table 3-3: System Management Connectors

Note that MSK_RST* is only present on these pins when it is bussed to all slots.

3.3.1.4. NVMRO

The backplane busses this signal to all slots.

Jumper JP1 allows for the signal to be grounded on the backplane.

3.4. INSTALLING PLUG-IN MODULES IN YOUR BACKPLANE

The backplane supports up to 6 OpenVPX® Plug-In Modules.

Refer to section 4.2.1 for information on which Plug-In Module goes into which slot.

The latching/unlatching mechanism on the Plug-In Module should suffice for insertion/extraction.



Do not use excessive force when installing or removing Plug-In Modules from the chassis. Use of excessive force can result in damage to the Backplane and/or Plug-In Module. Should excessive force be required, remove the Plug-In Module(s) and verify the alignment of the mechanicals and backplane.

There is no preset order to inserting Plug-In Modules into the backplane. Refer to the Plug-In Module and/or chassis user manual(s) for more information on inserting Plug-In Modules.

SECTION FOUR

4. UNDERSTANDING YOUR BACKPLANE

4.1. BACKPLANE CONNECTORS

The complete list of connectors utilized on the backplane is listed in Table 5-2.

4.2. POWER CONNECTORS

Slots are powered through power elements and for lower slot count backplanes, a combination of power elements and a header. The backplane distributes DC power (12V, 5V, 3.3V, 3.3V_AUX, +12V_AUX & -12V_AUX) to each slot through the internal copper planes.

The power elements are capable of providing 60 Amps in a 70° C ambient environment.

The AUX power connector (P27) for the narrower backplanes is rated at 4 Amps per pin. There is no derating information available.

4.2.1. VS1, VS2, VS3 AND GND

Per the specification, each slot can source 22A on Vs1, Vs2 and Vs3.

The Vs1, Vs2 and Vs3 power elements (as applicable) are on the top rear of the backplane.

Vs1 power elements are referenced from PE11-PE17 and are bused on the backplane.

Vs2 power elements are referenced from PE21-PE27 and are bused on the backplane.

Vs3 power elements are referenced from PE31-PE37 and are bused on the backplane.

There is one corresponding GND power element for each Vs[1-3] power element. GND power elements are on the lower rear of the backplane.

Ground power elements are referenced from PE40-PE60 and are bused on the backplane.

4.2.2. AUX POWER

Per the specification, each slot can source 1A on 3.3V_AUX, +12V_AUX and -12V_AUX.

Where space permits, this is done with power elements. If present, these will be located on the top rear of the backplane.

Where space does not permit, it is done with a PCB-wire header (P27).

Refer to Table 5-2 for a suitable mating connector and wire crimps. Table 4-1 provides the pinout for the AUX power connections.

Pin #	Signal	Signal
1	+12V_AUX	PE71
2	+12V_AUX	
3	3.3V_AUX	PE72
4	3.3V_AUX	
5	-12V_AUX	PE73
6	-12V_AUX	

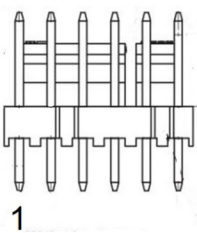


Table 4-1: AUX Power Connections

4.2.3. SAFETY GROUND

The top and bottom mounting rail surfaces are the connection point to safety ground.

The alignment keys each have a minimum 20 A path to the connection point.

Some backplanes will have a feature for allowing safety ground to be tied to logic ground. Refer to section 3.2.

4.2.4. DECOUPLING

Each slot has provisions for decoupling capacitors.

A high frequency decoupling capacitor (0.1 uf) is provided for each power rail at each slot.

Provisions for optional bulk filtering capacitors are provided for each power rail at each slot. These can be requested as an option when noisy power rails are expected.

4.3. SLOT IDENTIFICATION

4.3.1. SLOT KEYING

3U backplanes have 2 alignment/keying devices as required in the ANSI/VITA 46.0 specification.

6U backplanes have 3 alignment/keying devices as required in the ANSI/VITA 46.0 specification.

Table 4-2 provides the as-shipped keying settings for 3U and 6U backplanes.

Slot#	3U		6U		
	Key 1	Key 2	Key 1	Key 2	Key 3
1	270°	270°	315°	270°	270°
2	315°	270°	315°	315°	270°
3	0°	270°	315°	0°	270°
4	45°	270°	315°	45°	270°
5	90°	270°	315°	90°	270°
6	270°	315°	315°	270°	315°
7	315°	315°	315°	315°	315°
8	0°	315°	315°	0°	315°
9	45°	315°	315°	45°	315°
10	90°	315°	315°	90°	315°

11	270°	0°	315°	270°	0°
12	315°	0°	315°	315°	0°
13	0°	0°	315°	0°	0°
14	45°	0°	315°	45°	0°
15	90°	0°	315°	90°	0°
16	270°	45°	315°	270°	45°
17	315°	45°	315°	315°	45°
18	0°	45°	315°	0°	45°
19	45°	45°	315°	45°	45°
20	90°	45°	315°	90°	45°
21	270°	90°	315°	270°	90°

Table 4-2 Slot Keying

4.3.2. SLOT NUMBERING

Slots are numbered according to the ANSI/VITA 46 specification.

The leftmost slot (viewed from the front) always has a geographic address of 1 and will increment by one.

Table 4-3 illustrates the slot geographic address on the various length backplanes.

Slot#	GAP*	GA4*	GA3*	GA2*	GA1*	GA0*
1	Open	Open	Open	Open	Open	GND
2	Open	Open	Open	Open	GND	Open
3	GND	Open	Open	Open	GND	GND
4	Open	Open	Open	GND	Open	Open
5	GND	Open	Open	GND	Open	GND
6	GND	Open	Open	GND	GND	Open
7	Open	Open	Open	GND	GND	GND
8	Open	Open	GND	Open	Open	Open
9	GND	Open	GND	Open	Open	GND
10	GND	Open	GND	Open	GND	Open
11	Open	Open	GND	Open	GND	GND
12	GND	Open	GND	GND	Open	Open
13	Open	Open	GND	GND	Open	GND
14	Open	Open	GND	GND	GND	Open
15	GND	Open	GND	GND	GND	GND
16	Open	GND	Open	Open	Open	Open

Table 4-3 Geographic Addressing

4.4. BACKPLANE TOPOLOGY

Figure 4-1 illustrates the backplane topology. The dotted lines from the Payload and Switch slots are signals that are available to the complementary RTM.

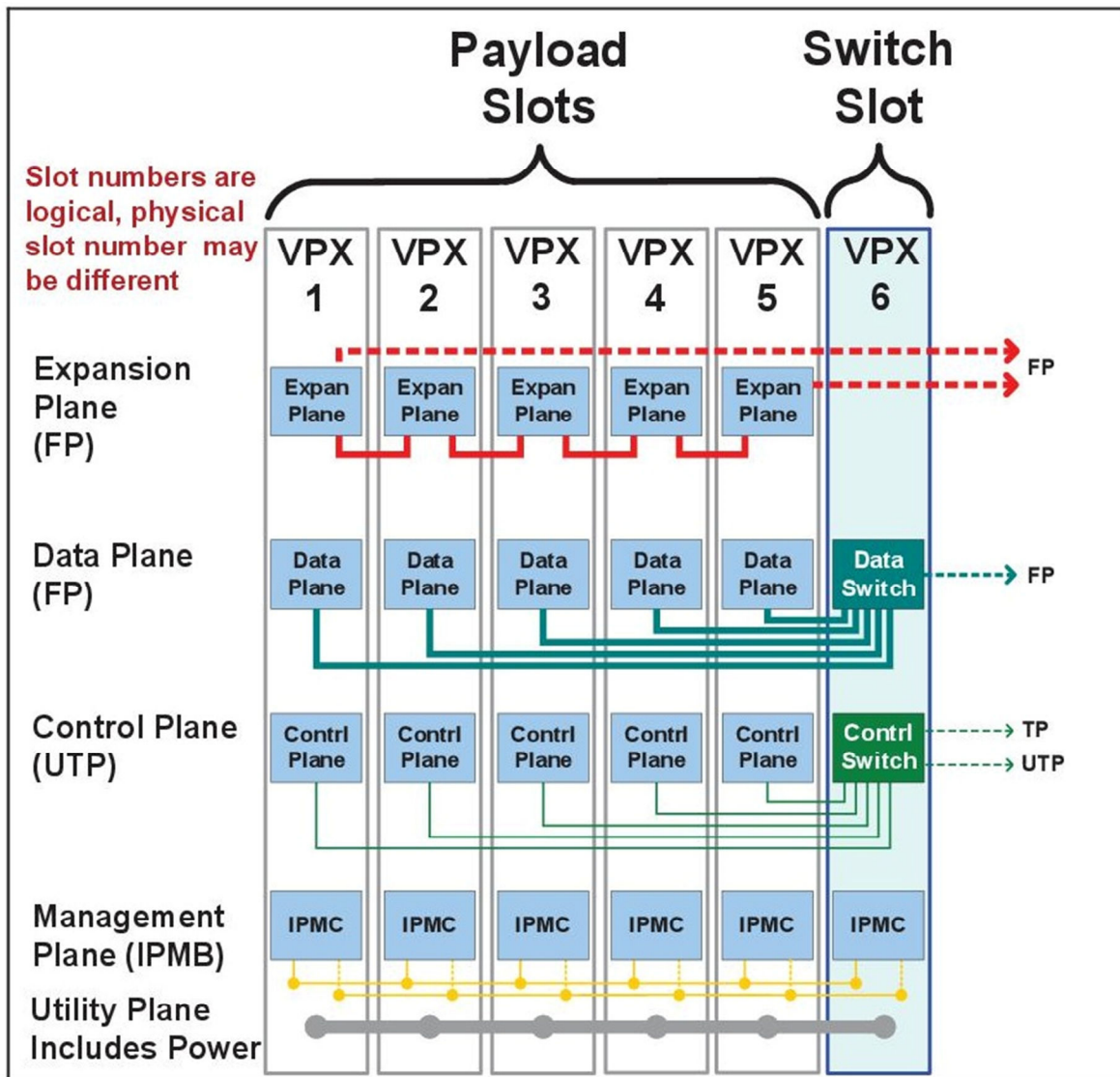


Figure 4-1: Backplane Topology

4.5. BACKPLANE PROFILE COMPATIBILITY

Table 4-4 displays the list of Backplane Profiles that the backplane is compatible with.

Slot profile information is also provided.

A "+" at the end of the profile name indicates that this particular profile was not approved as part of ANSI/VITA 65.1 at the time of publication of this document.

Backplane Profile Names	Mechanical		Channel Gbaud Rate				Payload		Control and Data Plane Switch	
	Pitch (in)	RTM conn	Control Plane (UTP)	Data Plane (FP)	Expansion Plane (FP)		Slot(s)	Slot Profile	Slot(s)	Slot Profile
BKP6-CEN05-15.2.2-1	1.0	46.10	8	8	8		1-5	SLT3-PAY-1F2F2U-14.2.2	6	SUT3-SWH-6F6U-14.4.1

Table 4-4: Backplane Profile Compatibility

4.6. SYS_CON*

This signal is pulled low on physical slot 1.

Each slot has the option of having this signal pulled low.

Consult Pixus Technologies for information on how this can be accomplished.

4.7. CONTROL PLANE

The backplane has the Control Plane Ports connected as shown in Table 4-5.

Logical Payload Slot	Payload Control Plane Port	Switch Control Plane Port
1	CPutp01	CPutp01
1	Cputp02	No Connect, can go to RTM
2	CPutp01	CPutp02
2	Cputp02	No Connect, can go to RTM
3	CPutp01	CPutp03
3	Cputp02	No Connect, can go to RTM
4	CPutp01	CPutp04
4	Cputp02	No Connect, can go to RTM
5	CPutp01	CPutp05
5	Cputp02	No Connect, can go to RTM

Table 4-5 Control Plane Port Allocation

4.8. EXPANSION PLANE

The backplane has the Control Plane Ports connected as shown in Figure 4-2.

Dotted lines are signals that are available to the adjacent RTM.

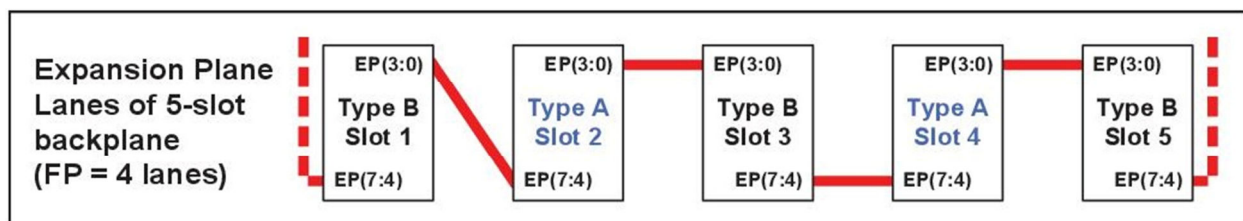


Figure 4-2: Expansion Plane Interconnect

4.9. DATA PLANE

The backplane has the Data Plane Ports connected as shown in Table 4-6.

Dotted lines in Figure 4-1 are signals that are available to the adjacent RTM.

Slot/Channel	DP01	DP02
1	VPX06-DP01	
2	VPX06-DP02	
3	VPX06-DP03	
4	VPX06-DP04	
5	VPX06-DP05	
6	VPX06-DS01	RTM

Table 4-6 Data Plane Port Allocation

4.10. CONNECTOR PINOUTS

4.10.1. J0

Table 4-7 defines the signals present on J0 for all slots.

	Row i	Row h	Row g	Row f	Row e	Row d	Row c	Row b	Row a
1	Vs1	Vs1	Vs1	Vs1	No Pad*	Vs2	Vs2	Vs2	Vs2
2	Vs1	Vs1	Vs1	Vs1	No Pad*	Vs2	Vs2	Vs2	Vs2
3	Vs3	Vs3	Vs3	Vs3	No Pad*	Vs3	Vs3	Vs3	Vs3
4	GND	SM2	SM3	GND	-12V_Aux	GND	SYSRESET*	NVMRO	GND
5	GND	GAP*	GA4*	GND	3.3V_Aux	GND	SM0	SM1	GND
6	GND	GA3*	GA2*	GND	+12V_Aux	GND	GA1*	GA0*	GND
7	TCK	GND	GND	TDO	TDI	GND	GND	TMS	TRST*
8	GND	REF_CLK-	REF_CLK+	GND	GND	AUX_CLK-	AUX_CLK+	GND	GND

Table 4-7 J0 Pin Assignment

4.10.1.1. REF/AUX_CLK

This are bussed differential pairs with an impedance of 130 Ohms \pm 10%, terminated with 61.9 Ohm \pm 1% resistors.

4.10.1.2. System Management

These signals are used to all slots with facilities for single-ended and differential termination at both ends of the signals.

When configured for IPMB operation, each signal must be pulled high to 3.3V_AUX by a 2k49 Ohm \pm 1% resistor at one end only.

Figure 4-3 illustrates the termination resistor configuration for the System Management bus.

Table 4-8 provides the mapping for the SM Bus termination resistor pairs (Term1/Term2 and Term3/Term4). Note that the resistor sites are all 0603 sized.

Signal	R1	R2	R3	R4	R5
SM0	R23/R11	R24/R12			R25/R13
SM1			R21/R9	R22/R10	R25/R13
SM2	R28/R16	R29/R17			R23/R18
SM3			R26/R14	R27/R15	R30/R18

Table 4-8 SM Bus Termination Resistor Mapping

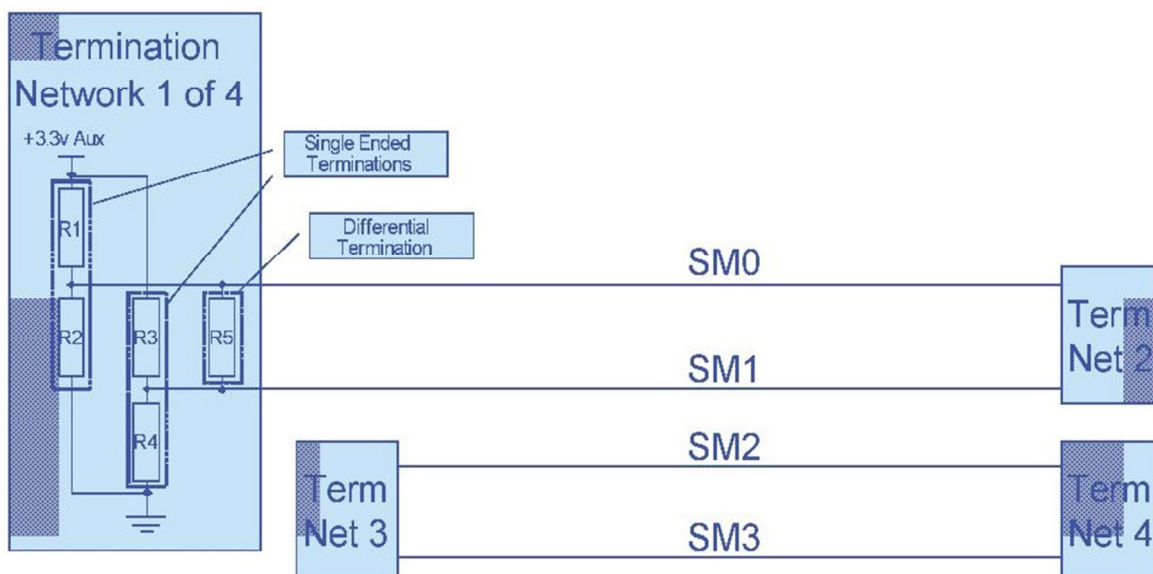


Figure 4-3 SM Bus Terminations

4.10.1.3. NVMRO

This signal is bussed to all slots.

Jumper JP1 allows for the signal to be grounded on the backplane.

4.10.1.4. SYSRESET*

This signal is bussed to all slots and is pulled high to 3.3V_AUX by a 220 Ohm +-5% resistor and pulled low by a 1k8 Ohm +-5% resistor.

4.10.2. J1 SIGNALS

Plug-In Module P1		Row G	Row F	Row E		Row D	Row C	Row B		Row A
Bplane J1		Row i	Row h	Row g	Row f	Row e	Row d	Row c	Row b	Row a
1	Data Plane Port 1 x4 / 2x2 / 4x1	GDiscrete1	GND	GND-J1	DP01-TD0-	DP01-TD0+	GND	GND-J1	DP01-RD0-	DP01-RD0+
2		GND	DP01-TD1-	DP01-TD1+	GND-J1	GND	DP01-RD1-	DP01-RD1+	GND-J1	GND
3		P1-VBAT	GND	GND-J1	DP01-TD2-	DP01-TD2+	GND	GND-J1	DP01-RD2-	DP01-RD2+
4		GND	DP01-TD3-	DP01-TD3+	GND-J1	GND	DP01-RD3-	DP01-RD3+	GND-J1	GND
5	Expan. Plane Port 1 x4 / 2x2 / 4x1	SYS_CON*	GND	GND-J1	EP00-TD-	EP00-TD+	GND	GND-J1	EP00-RD-	EP00-RD+
6		GND	EP01-TD-	EP01-TD+	GND-J1	GND	EP01-RD-	EP01-RD+	GND-J1	GND
7		Reserved	GND	GND-J1	EP02-TD-	EP02-TD+	GND	GND-J1	EP02-RD-	EP02-RD+
8		GND	EP03-TD-	EP03-TD+	GND-J1	GND	EP03-RD-	EP03-RD+	GND-J1	GND
9	Expan. Plane Port 2 x8 / 2x2 / 4x1	UD	GND	GND-J1	EP04-TD-	EP04-TD+	GND	GND-J1	EP04-RD-	EP04-RD+
10		GND	EP05-TD-	EP05-TD+	GND-J1	GND	EP05-RD-	EP05-RD+	GND-J1	GND
11		UD	GND	GND-J1	EP06-TD-	EP06-TD+	GND	GND-J1	EP06-RD-	EP06-RD+
12		GND	EP07-TD-	EP07-TD+	GND-J1	GND	EP07-RD-	EP07-RD+	GND-J1	GND
13	User Defined	UD	GND	GND-J1	UD	UD	GND	GND-J1	UD	UD
14		GND	UD	UD	GND-J1	GND	UD	UD	GND-J1	GND
15		Maskable Reset*	GND	GND-J1	CPutp02-TD-	CPutp02-TD+	GND	GND-J1	CPutp02-RD-	CPutp02-RD+
16		GND	CPutp01-TD-	CPutp01-TD+	GND-J1	GND	CPutp01-RD-	CPutp01-RD+	GND-J1	GND

Table 4-9 provides the pin assignments for J1 on the Payload slots.

Table 4-10 provides the pin assignments for J1 on the Switch slot.

Plug-In Module P1		Row G	Row F	Row E		Row D	Row C	Row B		Row A
Bplane J1		Row i	Row h	Row g	Row f	Row e	Row d	Row c	Row b	Row a
1	Data Plane Port 1 x4 / 2x2 / 4x1	GDiscrete1	GND	GND-J1	DP01-TD0-	DP01-TD0+	GND	GND-J1	DP01-RD0-	DP01-RD0+
2		GND	DP01-TD1-	DP01-TD1+	GND-J1	GND	DP01-RD1-	DP01-RD1+	GND-J1	GND
3		P1-VBAT	GND	GND-J1	DP01-TD2-	DP01-TD2+	GND	GND-J1	DP01-RD2-	DP01-RD2+
4		GND	DP01-TD3-	DP01-TD3+	GND-J1	GND	DP01-RD3-	DP01-RD3+	GND-J1	GND
5	Expan. Plane Port 1 x4 / 2x2 / 4x1	SYS_CON*	GND	GND-J1	EP00-TD-	EP00-TD+	GND	GND-J1	EP00-RD-	EP00-RD+
6		GND	EP01-TD-	EP01-TD+	GND-J1	GND	EP01-RD-	EP01-RD+	GND-J1	GND
7		Reserved	GND	GND-J1	EP02-TD-	EP02-TD+	GND	GND-J1	EP02-RD-	EP02-RD+
8		GND	EP03-TD-	EP03-TD+	GND-J1	GND	EP03-RD-	EP03-RD+	GND-J1	GND
9	Expan. Plane Port 2 x8 / 2x2 / 4x1	UD	GND	GND-J1	EP04-TD-	EP04-TD+	GND	GND-J1	EP04-RD-	EP04-RD+
10		GND	EP05-TD-	EP05-TD+	GND-J1	GND	EP05-RD-	EP05-RD+	GND-J1	GND
11		UD	GND	GND-J1	EP06-TD-	EP06-TD+	GND	GND-J1	EP06-RD-	EP06-RD+
12		GND	EP07-TD-	EP07-TD+	GND-J1	GND	EP07-RD-	EP07-RD+	GND-J1	GND
13	User Defined	UD	GND	GND-J1	UD	UD	GND	GND-J1	UD	UD
14		GND	UD	UD	GND-J1	GND	UD	UD	GND-J1	GND
15		Maskable Reset*	GND	GND-J1	CPutp02-TD-	CPutp02-TD+	GND	GND-J1	CPutp02-RD-	CPutp02-RD+
16		GND	CPutp01-TD-	CPutp01-TD+	GND-J1	GND	CPutp01-RD-	CPutp01-RD+	GND-J1	GND

Table 4-9 Payload J1 Pin Assignment

Plug-In Module P1		Row G	Row F	Row E		Row D	Row C	Row B		Row A
Bplane J1		Row i	Row h	Even	Odd			Even	Odd	
1	Data Plane Port 1	GDiscrete1	GND	GND-J1	DP01-TD0-	DP01-TD0+	GND	GND-J1	DP01-RD0-	DP01-RD0+
2		GND	DP01-TD1-	DP01-TD1+	GND-J1	GND	DP01-RD1-	DP01-RD1+	GND-J1	GND
3		P1-VBAT	GND	GND-J1	DP01-TD2-	DP01-TD2+	GND	GND-J1	DP01-RD2-	DP01-RD2+
4		GND	DP01-TD3-	DP01-TD3+	GND-J1	GND	DP01-RD3-	DP01-RD3+	GND-J1	GND
5	Data Plane Port 2	SYS_CON*	GND	GND-J1	DP02-TD0-	DP02-TD0+	GND	GND-J1	DP02-RD0-	DP02-RD0+
6		GND	DP02-TD1-	DP02-TD1+	GND-J1	GND	DP02-RD1-	DP02-RD1+	GND-J1	GND
7		Reserved	GND	GND-J1	DP02-TD2-	DP02-TD2+	GND	GND-J1	DP02-RD2-	DP02-RD2+
8		GND	DP02-TD3-	DP02-TD3+	GND-J1	GND	DP02-RD3-	DP02-RD3+	GND-J1	GND
9	Data Plane Port 3	UD	GND	GND-J1	DP03-TD0-	DP03-TD0+	GND	GND-J1	DP03-RD0-	DP03-RD0+
10		GND	DP03-TD1-	DP03-TD1+	GND-J1	GND	DP03-RD1-	DP03-RD1+	GND-J1	GND
11		UD	GND	GND-J1	DP03-TD2-	DP03-TD2+	GND	GND-J1	DP03-RD2-	DP03-RD2+
12		GND	DP03-TD3-	DP03-TD3+	GND-J1	GND	DP03-RD3-	DP03-RD3+	GND-J1	GND
13	Data Plane Port 4	UD	GND	GND-J1	DP04-TD0-	DP04-TD0+	GND	GND-J1	DP04-RD0-	DP04-RD0+
14		GND	DP04-TD1-	DP04-TD1+	GND-J1	GND	DP04-RD1-	DP04-RD1+	GND-J1	GND
15		Maskable Reset*	GND	GND-J1	DP04-TD2-	DP04-TD2+	GND	GND-J1	DP04-RD2-	DP04-RD2+
16		GND	DP04-TD3-	DP04-TD3+	GND-J1	GND	DP04-RD3-	DP04-RD3+	GND-J1	GND

Table 4-10 Switch J1 Pin Assignment

4.10.2.1. GDiscrete1

The backplane busses this signal to all slots.

The single-ended impedance is 50 Ohms.

470 Ohm +5% resistors terminate the signal at both end of the backplane to 3.3V_AUX.

4.10.2.2. SYS_CON*

Slot number 1 (leftmost) has this pin connected to ground.

To allow for ambiguity in the specification, all slots have provision for connecting this pin to ground.

4.10.2.3. UD

These pins are application specific and not defined. Note that these are strictly pass-through to the associated RTMs.

4.10.2.4. MaskableReset*

This pin is application specific and not defined. It could be bussed or individually routed to a connection point. This backplane busses the signal and routes it to P22 and P23.

4.10.2.5. P1-VBAT

The backplane busses this signal to all slots and to P26. Refer to Section 3.3.1.2.

4.10.3. J2 SIGNALS

Table 4-11 displays the assignment of signals on J2 for the Payload slots.

Plug-In Mod Pn	Row G	Row F	Row E		Row D	Row C	Row B		Row A
Backplane Jn			Even	Odd			Even	Odd	
	Row i	Row h	Row g	Row f	Row e	Row d	Row c	Row b	Row a
1	UD	GND	GND-Jn	UD	UD	GND	GND-Jn	UD	UD
2	GND	UD	UD	GND-Jn	GND	UD	UD	GND-Jn	GND
3	UD	GND	GND-Jn	UD	UD	GND	GND-Jn	UD	UD
4	GND	UD	UD	GND-Jn	GND	UD	UD	GND-Jn	GND
5	UD	GND	GND-Jn	UD	UD	GND	GND-Jn	UD	UD
6	GND	UD	UD	GND-Jn	GND	UD	UD	GND-Jn	GND
7	UD	GND	GND-Jn	UD	UD	GND	GND-Jn	UD	UD
8	GND	UD	UD	GND-Jn	GND	UD	UD	GND-Jn	GND
9	UD	GND	GND-Jn	UD	UD	GND	GND-Jn	UD	UD
10	GND	UD	UD	GND-Jn	GND	UD	UD	GND-Jn	GND
11	UD	GND	GND-Jn	UD	UD	GND	GND-Jn	UD	UD
12	GND	UD	UD	GND-Jn	GND	UD	UD	GND-Jn	GND
13	UD	GND	GND-Jn	UD	UD	GND	GND-Jn	UD	UD
14	GND	UD	UD	GND-Jn	GND	UD	UD	GND-Jn	GND
15	UD	GND	GND-Jn	UD	UD	GND	GND-Jn	UD	UD
16	GND	UD	UD	GND-Jn	GND	UD	UD	GND-Jn	GND

Table 4-11 Payload J2 Pin Assignment

Plug-In Module P2	Row G	Row F	Row E		Row D	Row C	Row B		Row A
Bplane J2			Even	Odd			Even	Odd	
	Row i	Row h	Row g	Row f	Row e	Row d	Row c	Row b	Row a
1	UD	GND	GND-J2	DP05-TD0-	DP05-TD0+	GND	GND-J2	DP05-RD0-	DP05-RD0+
2	GND	DP05-TD1-	DP05-TD1+	GND-J2	GND	DP05-RD1-	DP05-RD1+	GND-J2	GND
3	UD	GND	GND-J2	DP05-TD2-	DP05-TD2+	GND	GND-J2	DP05-RD2-	DP05-RD2+
4	GND	DP05-TD3-	DP05-TD3+	GND-J2	GND	DP05-RD3-	DP05-RD3+	GND-J2	GND
5	UD	GND	GND-J2	DS01-TD0-	DS01-TD0+	GND	GND-J2	DS01-RD0-	DS01-RD0+
6	GND	DS01-TD1-	DS01-TD1+	GND-J2	GND	DS01-RD1-	DS01-RD1+	GND-J2	GND
7	UD	GND	GND-J2	DS01-TD2-	DS01-TD2+	GND	GND-J2	DS01-RD2-	DS01-RD2+
8	GND	DS01-TD3-	DS01-TD3+	GND-J2	GND	DS01-RD3-	DS01-RD3+	GND-J2	GND
9	UD	GND	GND-J2	CSutp01-TD-	CSutp01-TD+	GND	GND-J2	CSutp01-RD-	CSutp01-RD+
10	GND	CPutp05-TD-	CPutp05-TD+	GND-J2	GND	CPutp05-RD-	CPutp05-RD+	GND-J2	GND
11	UD	GND	GND-J2	CPutp04-TD-	CPutp04-TD+	GND	GND-J2	CPutp04-RD-	CPutp04-RD+
12	GND	CPutp03-TD-	CPutp03-TD+	GND-J2	GND	CPutp03-RD-	CPutp03-RD+	GND-J2	GND
13	UD	GND	GND-J2	CPutp02-TD-	CPutp02-TD+	GND	GND-J2	CPutp02-RD-	CPutp02-RD+
14	GND	CPutp01-TD-	CPutp01-TD+	GND-J2	GND	CPutp01-RD-	CPutp01-RD+	GND-J2	GND
15	UD	GND	GND-J2	UD	UD	GND	GND-J2	UD	UD
16	GND	UD	UD	GND-J2	GND	UD	UD	GND-J2	GND

Table 4-12 Switch J2 Pin Assignment

4.10.4. REGULATORY AND SAFETY

The backplanes have been designed to comply with the following standards:

- EN 69050

- UL 1950

A clearance of 2.5 mm has been provided between AC voltages and chassis ground on all external layers. A clearance of 5 mm has been provided between AC and secondary voltages on all internal layers. A clearance of 0.4 mm has been provided between primary and secondary voltages on all internal layers.

SECTION FIVE

5. APPENDIX A

5.1. ACRONYMS

The following list provides definitions of acronyms used throughout this document.

ACRONYM	DEFINITION
5 HP	The width of a typical single width OpenVPX Slot. The distance between adjacent 5HP slots is exactly 1.00"
84HP	This is the typical maximum width of a 14 slot backplane. The mechanical drawings should be used for exact dimensions and backplane mounting screw locations.
ATR	Air Transport Rack
BP	Backplane
ChMC	Chassis Management Controller. An IPMC that is also capable of supporting the functions required of the Chassis Manager.
ECN	Engineering Change Notice
EMC	Electromagnetic Compatibility
ESD	Electrostatic Discharge
FCC	Federal Communications Commission
FE	Fast Ethernet (10/100)
FRU	Field Replaceable Unit
GA	Geographical Addressing
GE	Gigabit Ethernet (1000)
GPIO	General Purpose Input Output
HP	Horizontal Pitch (aperture width) 5.08mm (0.2")
I/O	Input/Output
I ² C	Intelligent Interface Controller
IPMB	Intelligent Platform Management Bus
IPMC	Intelligent Platform Management Controller. The portion of a Field Replaceable Unit (FRU) that interfaces to the OpenVPX IPMB-0 and represent that FRU and any device subsidiary to it.
LVDS	Low Voltage Differential Signal
N/C	Not Connected
P/N	Part Number
PCB	Printed Circuit Board
PCI	Peripheral Component Interconnect
PWM	Pulse Width Modulation
SBC	Single Board Computer
SMB	System Management Bus
SMD	System Management Device

ACRONYM	DEFINITION
U	Unit (vertical height) 44.45mm (1.75")
UL	Underwriter's Laboratory
V(I/O)	Voltage (Input/Output)
VPX	VME PCI X

5.2. TORQUE VALUES

Table 5-1 displays the recommended torque values for fasteners used on the backplanes.

Screws	Torque
Power Element (M3)	0.5 Nm (4.43 lbf.in)
Keyed Guide Pin	0.45 Nm (4 in-lb)

Table 5-1: Recommended Torque Values

5.3. LIST OF CONNECTORS

Table 5-2 displays the list of connectors utilized on the backplane.

Description	Reference	Vendor	Conn. P/N	Rating	Mating Conn. P/N
Power Elements	PE11-PE13 PE21-PE23 PE31-PE33 PE40-PE48	ERNI/ Würth	225693/7461057	94V-0	
Management 1x8	P22, P23	Molex	53398-0871	94V-0	51021-0800
JTAG Connector	P1-P6	Molex	53398-0571	94V-0	51021-0500
MultiGig Keyed Guide Pin 24mm 3.6-7.5mm	K1[01-06] K2[01-06]	TE	1410956-1	94V-0	
MultiGig RT T2.8" Half Left	J0[01-06] RJ2[01-06]	TE/ept	1410186-2 / 308- 52200-42	94V-0	
MultiGig RT T2.8" Full Center	J1[01-06]	TE/ept	1410140-2 / 308- 50100-42	94V-0	
MultiGig RT T2.8" Full Center Rear w 1-8	RJ0[01-06]	TE/ept	1410965-2 / 308- 50102-42	94V-0	
MultiGig RT T2.8" Full Right	J2[01-06]	TE/ept	1410142-2 / 308- 51100-42	94V-0	
MultiGig RT T2.8" Full Center Rear w/o 1-8	RJ006	TE/ept	1410964-2 / 308- 50101-42	94V-0	
Aux Power (1x6)	P27	Molex	22-11-2066	94V-0	22012061
VBat (1x3)	P26	Molex	22-11-2036	94V-0	22012031
NVMRO	JP1	Samtec	TSW-102-08-G-S	94V-0	Shunt

Crimps for P26, P27 - 8550102

Crimps for P1 – P6 – 500588100

Table 5-2: Backplane Connectors



The mating headers for P26 and P27 may not have a 1-to-1 pin alignment.

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