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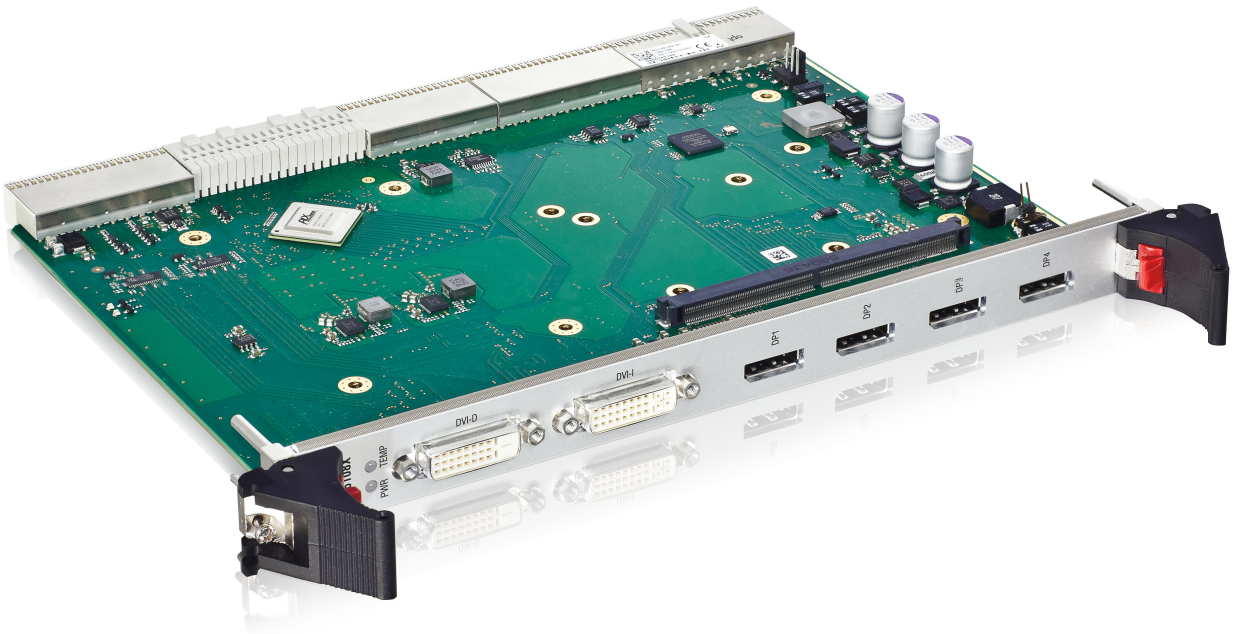

CP6108X/CP6-GPU8860

Doc. ID: 1056-9946, Rev. 1.0

Date: April 16, 2015

Revision History

Revision	Brief Description of Changes	Date of Issue
1.0	Initial issue	16-Apr-2015

Imprint

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Disclaimer

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1 Introduction

1.1 Board Overview

The CP6108X is a 6U high-speed CompactPCI® carrier for an MXM3.0 GPU module and has been designed to integrate leading-edge, parallel processing capabilities into CompactPCI® systems. It can accommodate one MXM3.0 type A or type B module with an AMD Radeon™ GPU designed for the embedded industry or any other customer-sourced MXM3.0 GPU module.

The CP6108X combines enormous price-performance and performance-per-watt advantages of GPU and GPGPU computing with the robustness, longevity, and modularity of CompactPCI® systems. This is the perfect symbiosis not only for some of the most demanding graphics-intensive applications in modular or rugged systems, but also for enhanced workload and massive parallel computing in harsh environments. Typical sample applications in avionics are geographic information systems, 360-degree situational awareness, and diminished vision enhancement. Typical public- and government-related tasks are radar, sonar, or video surveillance and FFT calculations.

On request, Kontron provides assistance in developing suitable customer-specific cooling solutions for the CP6108X for use with various MXM3.0 modules. For MXM3.0 type A modules in conjunction with the CP6108X, Kontron offers a specifically designed heat sink solution. It is the responsibility of the system integrator to ensure that sufficient cooling is provided when operating the CP6108X equipped with an MXM3.0 module.

The CP6108X is also available with the AMD Radeon E8860 GPU module mounted (this assembly hereinafter referred to as CP6-GPU8860). The CP6-GPU8860 comes with an optimized passive cooling solution, which is a reference for solutions to any other MXM3.0 type A module for use with the CP6108X. An active fansink is avoided on board level to increase system ruggedization for harsh environments. This cooling solution saves valuable board space while the entire assembly still fits to only 4HP height. For further information on the CP6-GPU8860, refer to Chapter 5.

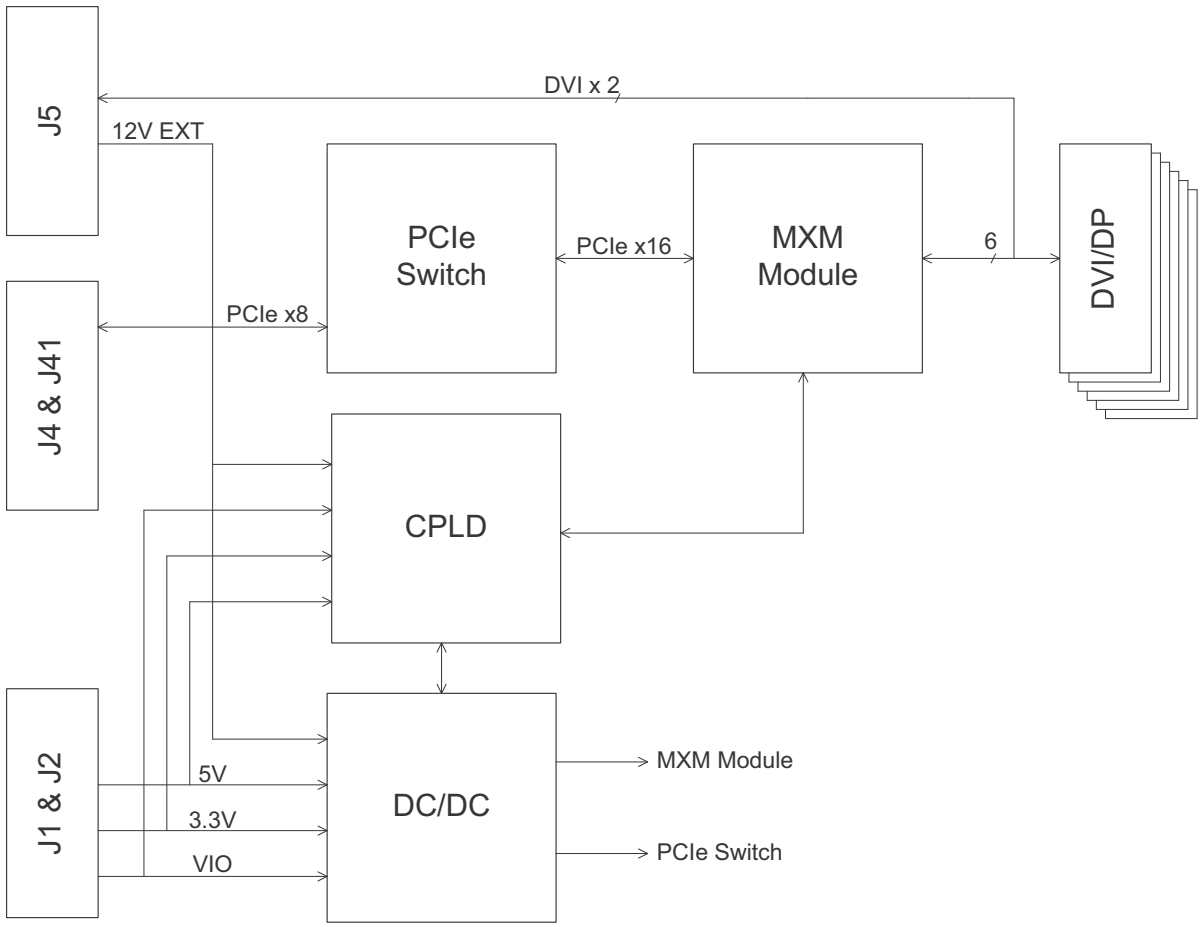
The high-speed serial I/O interconnection (PICMG2.20) enables high data throughput via PCI Express® within the system. Data stream conversion by the CP6108X from x8 PCI Express 2.1 (MXM) to x8 or x4 PCI Express® 3.0 (system), if required, allows for maximum possible data bandwidth with respect to the capabilities of the selected CPU.

1.2 Board Diagrams

The following diagrams provide additional information concerning board functionality and component layout.

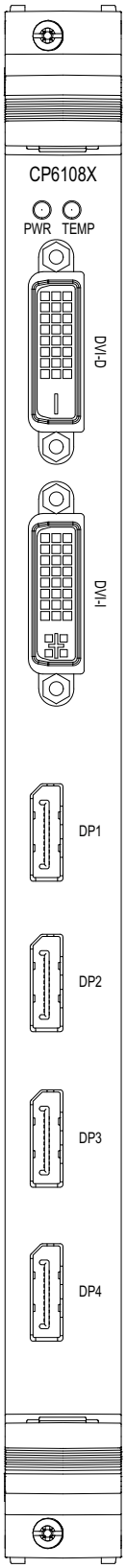
1.2.1 Functional Block Diagram

Figure 1: CP6108X Functional Block Diagram



1.2.2 Front Panel

Figure 2: CP6108X Front Panel



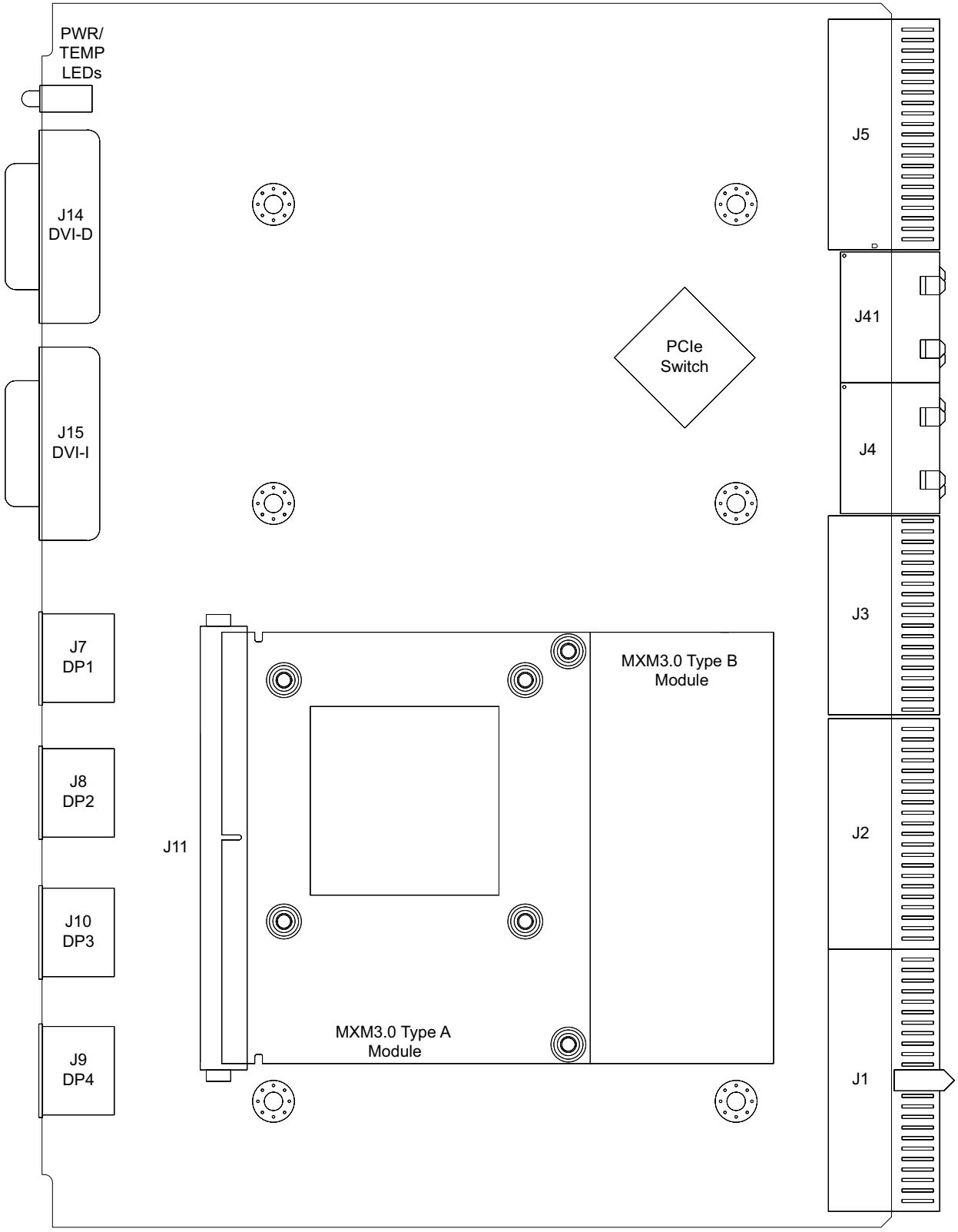
Power Status LED

PWR (green/orange/red): Power Status of the CP6108X/MXM module

TEMP (green/orange/red): Temperature Status of the MXM module

1.2.3 Board Layout

Figure 3: CP6108X Board Layout (Top View)



1.3 Technical Specification

Table 1: CP6108X Main Specifications

FEATURES		SPECIFICATIONS
Switch	PCI Express Switch	ExpressLane™ PEX 8724 PCI Express 3.0 switch from PLX Technology used to provide maximum performance to an MXM module: » One x8 PCI Express Gen3 upstream port » One x16 PCI Express Gen3 downstream port
Connectors	DVI	Two DVI interfaces on the front panel routed to the rear I/O connector J5: » One standard DVI-D connector, J14 » One standard DVI-I connector, J15
	DisplayPort	Four DisplayPort connectors, J7, J8, J9, and J10
	MXM3.0	One standard MXM3.0 connector, J11, for connecting an MXM3.0 type A or type B module to the CP6108X
	High-Speed Serial I/O Interconnection	The following interface is provided to the backplane via two high-speed serial ZDplus connectors, J4 and J41 (PICMG 2.20): » One x8 PCI Express 3.0 interface operating at 8 GT/s as end point (non-transparent bridge)
	CompactPCI	CompactPCI interface: » Compliant with CompactPCI Specification PICMG 2.0 R 3.0: » Peripheral slot functionality » 3.3V or 5V signaling levels (universal signaling support) » No hot swap support » Four CompactPCI connectors J1, J2, J3 and J5
LED	Front Panel LED	Power Status LED: » PWR (green): Power Status of the CP6108X/MXM module » TMP (green/orange/red): Temperature Status of the MXM module
General	Mechanical	6U, 4 HP, CompactPCI-compliant form factor
	Power Consumption	approx. 3 W (without MXM module)
	Power Supply	3.3V and 5V DC in accordance with the CompactPCI® specification optional +12V DC external voltage for MXM module voltage supply only
	Temperature Range (without MXM module)	Operational: 0°C to +60°C Standard -40°C to +70°C Extended (with sufficient cooling for the PCI Express switch) Storage: -40°C to +85°C
	Cooling	Depending on the integrated MXM3.0 module, an appropriate heat sink for the module and the PCI Express switch as well as sufficient airflow must be provided to ensure optimal operation and long-term reliability of the CP6108X. For further information, please contact Kontron.
	Climatic Humidity	93% RH at 40 °C, non-condensing (acc. to IEC 60068-2-78)
	Dimensions	233.35 mm x 160 mm
	Board Weight	440 grams (without MXM module and without cooling solution)

1.4 Standards

This product complies with the requirements of the following standards.

Table 2: Standards

TYPE	ASPECT	STANDARD	REMARKS
CE	Emission	EN 55022, IEC 61000-6-3	--
	Immunity	EN 55024, IEC 61000-6-2	--
	Electrical Safety	EN 60950-1	--
Mechanical	Mechanical Dimensions	IEEE 1101.10	--
Environmental	Climatic Humidity	IEC 60068-2-78 (see note below)	--
	WEEE	Directive 2002/96/EC Waste electrical and electronic equipment	--
	RoHS 2	Directive 2011/65/EU Restriction of the use of certain hazardous substances in electrical and electronic equipment	--
	Operating Vibration (Sinusoidal)	IEC 60068-2-6	Ruggedized version test parameters: 10-300 (Hz) frequency range 5 (g) acceleration 1 (oct/min) sweep rate 10 cycles/axis 3 axes
	Operating Shocks	IEC 60068-2-27	Ruggedized version test parameters: 30 (g) acceleration 9 (ms) shock duration half sine 3 number of shocks per direction (total: 18) 6 directions 5 (s) recovery time
	Operating Bumps	IEC 60068-2-27	Ruggedized version test parameters: 15 (g) acceleration 11 (ms) shock duration half sine 500 number of shocks per direction 6 directions 1 (s) recovery time

Note: Customers desiring to perform further environmental testing of the CP6108X must contact Kontron for assistance prior to performing any such testing.

Boards **without conformal coating** must not be exposed to a change of temperature which can lead to condensation, as this may cause irreversible damage especially when the board is powered up again.

Kontron does not accept any responsibility for damage to products resulting from destructive environmental testing.

1.5 Related Publications

The following publications contain information relating to this product.

Table 3: Related Publications

PRODUCT	PUBLICATION
CompactPCI Systems	PICMG 2.0, Rev. 3.0 CompactPCI Specification PICMG 2.20, Rev. 1.0 CompactPCI Packet Serial Mesh Backplane Specification
	Kontron CompactPCI Backplane Manual, ID 24229
PCI Express	PCI Express Base Specification Revision 3.0
MXM	MXM Graphics Module, Mobile PCI Express Module Electromechanical Specification V3.1 R1.0
All Kontron products	Product Safety and Implementation Guide, ID 1021-9142

2 Functional Description

2.1 Board Interfaces

2.1.1 Front Panel LEDs

The CP6108X provides two LEDs on the front panel, one PWR LED for indicating the power status of the CP6108X/MXM module and one TMP LED for indicating the temperature status of the MXM module.

Table 4: Front Panel LEDs

LED	COLOR	FUNCTION
PWR	green	12V external voltage, 3.3V and 5V on the CP6108X and the MXM module in order
	orange	12V internal voltage,3.3V and 5V on the CP6108X and the MXM module in order (The 12V internal voltage is automatically generated if the 12V external voltage is not provided.)
	red	At least one voltage wrong
TEMP	green	MXM Module temperature in order
	orange	MXM Module temperature alert
	red	MXM Module overtemperature

2.1.2 DVI Interfaces

The CP6108X provides two DVI interfaces, one standard DVI-D interface implemented as a standard DVI-D connector, J14, and one standard DVI-I interface implemented as a standard DVI-I connector, J15. The DVI interfaces are routed both to the front panel DVI connectors and to the CompactPCI connector J5 on the rear I/O.

2.1.3 DisplayPort Interfaces

The CP6108X provides four standard DisplayPort interfaces for connection to monitors. They are implemented as standard DisplayPort connectors, J7(DP_1), J8 (DP_2), J9 (DP_3), and J10 (DP_4), on the front panel. Monitors with DVI ports may also be connected to the DP ports via a DP-to-DVI adapter.

2.1.4 MXM Interface

The CP6108X provides one standard MXM3.0 interface implemented as a standard MXM3.0 connector, J11, for mounting an MXM3.0 type A or Type B module.

The CP6108X allows multiple-display configuration depending on the GPU features. The following table indicates the minimum set of displays that an MXM3.0 module must support. However, the CP6108X is allowed to have no displays connected at all.

Table 5: Required and Optional Display Support

	DP_A	DP_B	DP_C	DP_D	LVDS_L	LVDS_U
DVI-D	required	optional	required	optional	optional	optional
DVI-I	required	optional	required	optional	required	optional
DP	required	optional	required	optional	optional	optional
DP Dual-Mode	required	optional	required	optional	optional	optional

Table 6: CP6108X Port Assignment

MXM Function	DP_A	DP_B	DP_C	DP_D	LVDS_L	LVDS_U
CP6108X	DVI-I	DP_2	DP_1	DP_3	DVI-D	DP_4

2.1.5 CompactPCI and ZDplus Connectors

The CP6108X provides four standard CompactPCI connectors (2mm hard metric) designated as J1, J2, J3, and J5, and two high-speed serial ZDplus connectors, J4 and J41, for back-plane interconnection.

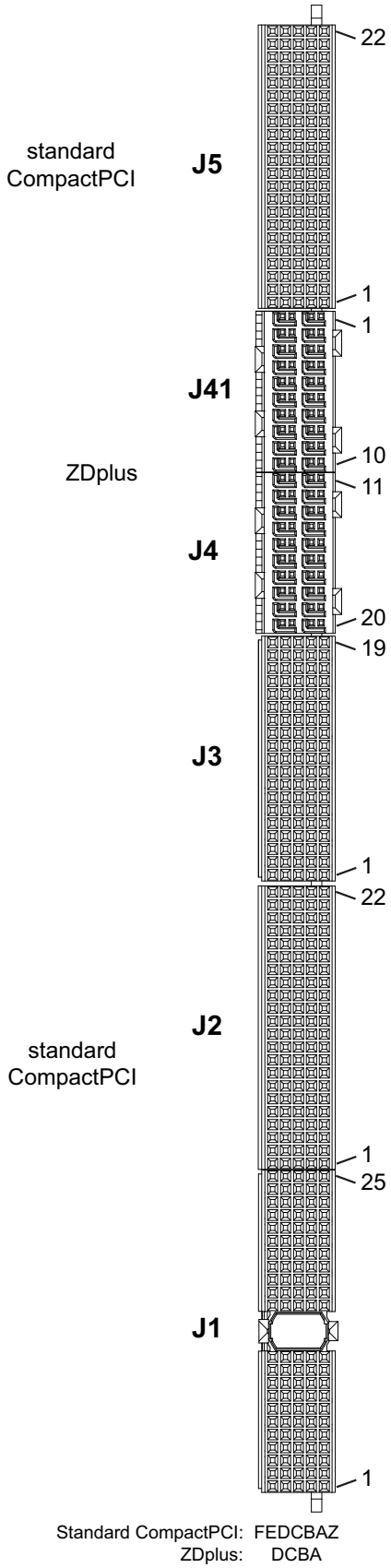
Their functions are as follows:

- J1, J2, and J3: CompactPCI interface with power and PCIe clock signals
- J5 with rear I/O interface functionality for DVI support and 12V external voltage for the MXM module
- J4 and J41 for high-speed serial I/O interconnection

2.1.5.1 CompactPCI Connector Keying

The CompactPCI connector J1 supports guide lugs to ensure a correct polarized mating. The CP6108X supports universal PCI VI/O signaling voltages.

Figure 4: CompactPCI and ZDplus Connectors



2.1.5.2 CompactPCI Connectors J1 and J2 Pinout

The CP6108X is provided with two 2 mm x 2 mm pitch female CompactPCI connectors, J1 and J2.

Table 7: CompactPCI Connector J1 Pinout

PIN	Z	A	B	C	D	E	F
25	NC	5V	NC	NC	3.3V	5V	GND
24	NC	NC	5V	V(I/O)	NC	NC	GND
23	NC	3.3V	NC	NC	5V	NC	GND
22	NC	NC	GND	3.3V	NC	NC	GND
21	NC	3.3V	NC	NC	NC	NC	GND
20	NC	NC	GND	V(I/O)	NC	NC	GND
19	NC	3.3V	NC	NC	GND	NC	GND
18	NC	NC	GND	3.3V	NC	NC	GND
17	NC	3.3V	Res.	Res.	GND	NC	GND
16	NC	NC	GND	V(I/O)	NC	NC	GND
15	NC	3.3V	NC	NC	NC	NC	GND
14-12	Key Area						
11	NC	NC	NC	NC	GND	NC	GND
10	NC	NC	GND	3.3V	NC	NC	GND
9	NC	NC	NC	NC	GND	NC	GND
8	NC	NC	GND	V(I/O)	NC	NC	GND
7	NC	NC	NC	NC	GND	NC	GND
6	NC	NC	GND	3.3V	NC	NC	GND
5	NC	NC	NC	CPCI_RST#	GND	NC	GND
4	NC	NC	NC	V(I/O)	NC	NC	GND
3	NC	NC	NC	NC	5V	NC	GND
2	NC	NC	5V	NC	NC	NC	GND
1	NC	5V	-12V	NC	+12V	5V	GND

Table 8: 64-bit CompactPCI Connector J2 Pinout

PIN	Z	A	B	C	D	E	F
22	NC	NC	NC	NC	NC	NC	GND
21	NC	NC	NC	NC	NC	NC	GND
20	NC	NC	NC	NC	GND	NC	GND
19	NC	NC	NC	NC	NC	NC	GND
18	NC	NC	NC	NC	GND	NC	GND
17	NC	NC	GND	NC	NC	NC	GND
16	NC	NC	NC	NC	GND	NC	GND
15	NC	NC	GND	NC	NC	NC	GND
14	NC	NC	NC	NC	GND	NC	GND
13	NC	NC	GND	V(I/O)	NC	NC	GND
12	NC	NC	NC	NC	GND	NC	GND
11	NC	NC	GND	V(I/O)	NC	NC	GND
10	NC	NC	NC	NC	GND	NC	GND
9	NC	NC	GND	V(I/O)	NC	NC	GND
8	NC	NC	NC	NC	GND	NC	GND
7	NC	NC	GND	V(I/O)	NC	NC	GND
6	NC	NC	NC	NC	GND	NC	GND
5	NC	NC	GND	V(I/O)	NC	NC	GND
4	NC	V(I/O)	NC	NC	GND	NC	GND
3	NC	NC	GND	NC	NC	NC	GND
2	NC	NC	NC	NC	NC	NC	GND
1	NC	NC	GND	NC	NC	NC	GND

2.1.5.3 CompactPCI Rear I/O Connectors J3 and J5 Pinout

Table 9: CompactPCI Rear I/O Connector J3 Pinout

PIN	Z	A	B	C	D	E	F
19	NC	5V	5V	NC	NC	NC	GND
18	NC	NC	NC	NC	NC	NC	GND
17	NC	NC	NC	NC	NC	NC	GND
16	NC	NC	NC	NC	NC	NC	GND
15	NC	NC	NC	NC	NC	NC	GND
14	NC	NC	NC	NC	NC	NC	GND
13	NC	NC	NC	NC	NC	NC	GND
12	NC	NC	NC	NC	NC	NC	GND
11	NC	NC	NC	NC	NC	NC	GND
10	NC	NC	NC	NC	NC	NC	GND
9	NC	NC	NC	NC	NC	NC	GND
8	NC	NC	NC	NC	NC	NC	GND
7	NC	NC	NC	NC	NC	NC	GND
6	NC	NC	NC	NC	NC	NC	GND
5	NC	NC	NC	NC	NC	NC	GND
4	NC	NC	NC	NC	NC	NC	GND
3	NC	NC	NC	NC	NC	NC	GND
2	NC	NC	NC	NC	NC	NC	GND
1	NC	NC	NC	NC	NC	NC	GND

Table 10: CompactPCI Rear I/O Connector J5 Pinout

PIN	Z	A	B	C	D	E	F
22	NC	NC	NC	12V_MXM	NC	NC	GND
21	NC	NC	NC	12V_MXM	NC	NC	GND
20	NC	NC	NC	12V_MXM	NC	NC	GND
19	NC	GND	GND	12V_MXM	NC	NC	GND
18	NC	DVI2_TX0+	DVI2_TX0-	12V_MXM	GND	GND	GND
17	NC	DVI2_TX2+	DVI2_TX2-	12V_MXM	DVI2_TX1+	DVI2_TX1-	GND
16	NC	NC	HPD2	12V_MXM	NC	NC	GND
15	NC	DVI2_TXC+	DVI2_TXC-	12V_MXM	DVI2_DDC_SDA	DVI2_DDC_SCL	GND
14	NC	GND	GND	12V_MXM	GND	GND	GND
13	NC	DVI1_TX0+	DVI1_TX0-	12V_MXM	DVI1_TX1+	DVI1_TX1-	GND
12	NC	DVI1_TX2+	DVI1_TX2-	12V_MXM	NC	5V	GND
11	NC	NC	HPD1	GND	DVI1_DDC_SDA	DVI1_DDC_SCL	GND
10	NC	DVI1_TXC+	DVI1_TXC-	GND	NC	NC	GND
9	NC	GND	GND	GND	GND	GND	GND
8	NC	NC	NC	GND	NC	NC	GND
7	NC	GND	GND	GND	GND	GND	GND
6	NC	NC	NC	GND	NC	NC	GND
5	NC	GND	GND	GND	GND	GND	GND
4	NC	NC	NC	GND	NC	NC	GND
3	NC	GND	GND	GND	GND	GND	GND
2	NC	NC	NC	GND	NC	NC	GND
1	NC	GND	GND	GND	GND	GND	GND

Table 11: CompactPCI Rear I/O Connector J5 Signals

SIGNAL	DESCRIPTION
DVI1	DVI port 1 signaling
DVI2	DVI port 2 signaling
HPD1	Hot plug detection for DVI port 1
HPD2	Hot plug detection for DVI port 2
12V_MXM	+12V DC external voltage for MXM module voltage supply

2.1.5.4 High-Speed Serial ZDplus Connectors J41 and J4 Pinout

The CP6108X provides backplane connectivity via two high-speed serial ZDplus connectors, J4 and J41, and supports the x8 PCI Express 3.0 interface operating at 8 GT/s as an end point (non transparent bridge).

The CP6108X is compatible with all Kontron 6U CompactPCI passive backplanes that are compliant with the PICMG 2.20 specification.

Table 12: High-Speed Serial ZDplus Connector J41 Pinout

POS	A	B	C	D
1	PE_RST#	Res.	Res.	Res.
2	NC	NC	NC	NC
3	NC	NC	NC	NC
4	NC	NC	NC	NC
5	NC	NC	NC	NC
6	NC	NC	NC	NC
7	NC	NC	NC	NC
8	NC	NC	NC	NC
9	NC	NC	NC	NC
10	NC	NC	NC	NC

Table 13: High-Speed Serial ZDplus Connector J4 Pinout

POS	A	B	C	D
11	NC	NC	NC	NC
12	PE_TX7+	PE_TX7-	PE_RX7-	PE_RX7+
13	PE_TX6+	PE_TX6-	PE_RX6-	PE_RX6+
14	PE_TX5+	PE_TX5-	PE_RX5-	PE_RX5+
15	PE_TX4+	PE_TX4-	PE_RX4-	PE_RX4+
16	PE_TX3+	PE_TX3-	PE_RX3-	PE_RX3+
17	PE_TX2+	PE_TX2-	PE_RX2-	PE_RX2+
18	PE_TX1+	PE_TX1-	PE_RX1-	PE_RX1+
19	PE_TX0+	PE_TX0-	PE_RX0-	PE_RX0+
20	PE_CLK+	PE_CLK-	NC	NC

Table 14: High-Speed Serial ZDplus Connectors J41 and J4 Signal Description

SIGNAL	DESCRIPTION
PE_TX/RX	PCI Express reference transmit/receive signals
PE_CLK	PCI Express reference clock signals

3 Power Considerations

3.1 CP6108X Voltage Ranges

The CP6108X has been designed for optimal power input and distribution. Still it is necessary to observe certain criteria essential for application stability and reliability.

The system power supply must comply with the CompactPCI® specification.

The following table specifies the ranges for the input power voltage within which the board is functional.

Table 15: DC Operational Input Voltage Range

INPUT SUPPLY VOLTAGE	ABSOLUTE RANGE
+3.3 V	3.2 V min. to 3.47 V max.
+5 V	4.85 V min. to 5.25 V max.
+12 V	11.4 V min. to 12.6 V max.
-12 V	-11.4 V min. to -12.6 V max.

Note: Failure to comply with the instructions above may result in damage to the board or improper operation.

3.1.1 Start-Up Requirement

Power supplies must comply with the following guidelines, in order to be used with the CP6108X:

- Beginning at 10% of the nominal output voltage, the voltage must rise within > 0.1 ms to < 20 ms to the specified regulation range of the voltage. Typically: > 5 ms to < 15 ms.
- There must be a smooth and continuous ramp of each DC output voltage from 10% to 90% of the regulation band.
- The slope of the turn-on waveform shall be a positive, almost linear voltage increase and have a value from 0 V to nominal Vout.

3.1.2 Power-Up Sequence

The +5 VDC output level must always be equal to or higher than the +3.3 VDC output during power-up and normal operation.

Both voltages must reach their minimum in-regulation level not later than 20 ms after the output power ramp start.

3.1.3 Regulation

The power supply shall be unconditionally stable under line, load, unload and transient load conditions including capacitive loads. The operation of the power supply must be consistent even without the minimum load on all output lines.

Note: All of the input voltages must be functionally coupled to each other so that if one input voltage fails, all other input voltages must be regulated proportionately to the failed voltage. For example, if the +5V begins to decrease, all other input voltages must decrease accordingly. This is required in order to preclude cross currents within the CP6108X.
Failure to comply with above may result in damage to the board or improper system operation.

Note: If the main power input is switched off, the supply voltages will not go to 0V instantly. It will take a couple of seconds until the capacitors are discharged. If the voltage rises again before it has gone below a certain level, the circuits may enter a latch-up state where even a hard RESET will not help any more. The system must be switched off for at least 10 seconds before it may be switched on again. If problems still occur, turn off the main power for 30 seconds before turning it on again.

3.2 Power Consumption

The power consumption of the CP6108X is approx.3 W.

The power consumption measurement was carried out using the following testing parameters:

- CP6108X installed in a peripheral slot
- Front panel ports not connected
- MXM module not installed
- +3.3 V and 5 V main supply voltage
- 2 m/s airflow
- Ambient temperature: 25°C

3.3 Power Supply for the MXM3.0 Module

The CP6108X provides up to 40 W for the MXM3.0 module. MXM3.0 modules consuming more than 40 W must be supplied with external +12 V voltage via the J5 connector.

4 Installation

This chapter is oriented towards an application environment. Some aspects may, however, be applicable to a development environment.

4.1 Safety

To ensure personnel safety and correct operation of this product, the following safety precautions must be observed:

- All operations involving the CP6108X require that personnel be familiar with system equipment, safety requirements and the CP6108X.
- This product contains electrostatically sensitive components which can be seriously damaged by electrical static discharge (ESD). Therefore, proper handling must be ensured at all times.
- Whenever possible, unpack or pack this product only at EOS/ESD safe work stations. Where a safe work station is not guaranteed, it is important for the user to be electrically discharged before touching the product with his/her hands or tools. This is most easily done by touching a metal part of your system housing.
- Do not handle this product out of its protective enclosure while it is not used for operational purposes unless it is otherwise protected.
- Do not touch components, connector-pins or traces.

Kontron assumes no liability for any damage resulting from failure to comply with these requirements.

4.2 General Instructions on Usage

In order to maintain Kontron's product warranty, this product must not be altered or modified in any way. Changes or modifications to the device, which are not explicitly approved by Kontron and described in this manual or received from Kontron's Technical Support as a special handling instruction, will void your warranty.

This device should only be installed in or connected to systems that fulfill all necessary technical and specific environmental requirements. This applies also to the operational temperature range of the specific board version, which must not be exceeded. If batteries are present, their temperature restrictions must be taken into account.

4.3 Board Installation

The CP6108X is designed for use in a peripheral slot.

4.3.1 Board Insertion

Prior to following the steps below, ensure that the safety requirements are met.

Note: The CP6108X is not hot swap capable.

To insert the CP6108X in a system, proceed as follows:

1. Ensure that no power is applied to the system before proceeding.
2. Ensure that the board ejection handles are open.
3. Insert the board into the slot designated until it makes contact with the backplane connectors.
4. Using the ejector handles, engage the board with the backplane. When the ejector handles are closed, the board is engaged.
5. Fasten the front panel retaining screws.
6. Connect all external interfacing cables to the board as required.

4.3.2 Board Removal

Prior to following the steps below, ensure that the safety requirements are met. When removing a board from the system, particular attention must be paid to the components that may be hot, such as heat sink, etc.

Note: The CP6108X is not hot swap capable.

To remove the CP6108X from a system, proceed as follows:

1. Ensure that no power is applied tot he system before proceeding.
2. Unlock the board ejection handles by pressing their release buttons.
3. Disconnect any interfacing cables that may be connected to the board.
4. Unscrew the front panel retaining screws.
5. Using the ejector handles, disengage the board from the backplane and remove it from the system.
6. Dispose of the board as required.

4.4 MXM3.0 Module Installation

The CP6108X supports the installation of an MXM3.0 type A or type B module via the J11 connector. The MXM3.0 module must be physically installed on the CP6108X prior to installation of the CP6108X in the system. During installation it is necessary to ensure that the MXM3.0 module is properly seated in the onboard connector J11, i.e. the pins are correctly aligned and not bent. Ensure that the module is properly secured to the CP6108X.

The CP6108X equipped with an MXM3.0 module must be fitted with an appropriate heat sink to ensure sufficient cooling. For MXM3.0 type A modules in conjunction with the CP6108X, Kontron offers a specifically designed heat sink solution. It is the responsibility of the system integrator to ensure that sufficient cooling is provided when operating the CP6108X equipped with an MXM3.0 module. Please contact Kontron for further information on suitable cooling solutions.

For information on the installation of the MXM3.0 module, refer to the documentation provided with the module.

5 CP6-PU8860

5.1 Overview

The CP6-GPU8860 is a 6U high-speed CompactPCI® carrier CP6108X equipped with an AMD Radeon E8860 GPU module. The CP6-GPU8860 provides an optimized passive cooling solution that saves valuable board space while the entire assembly still fits to only 4HP height. Thanks to its optimal performance-per-watt profile, the CP6-GPU8860 is perfectly suitable for embedded applications that require outstanding multi-display experiences and massive parallel computing but have exacting power efficiency and heat dissipation requirements.

The high-speed serial I/O interconnection (PICMG2.20) enables high data throughput via PCI Express® within the system. Data stream conversion by the CP6108X from x8 PCI Express 2.1 (MXM) to x8 or x4 PCI Express® 3.0 (system), if required, allows for maximum possible data bandwidth with respect to the capabilities of the selected CPU board in the system.

The following sections provide information specific to the CP6-GPU8860.

5.2 Technical Specifications

Table 16: CP6-GPU8860 Technical Specifications

FEATURES	SPECIFICATIONS
Power Supply	3.3V and 5V DC in accordance with the CompactPCI® Specification optional +12V DC external voltage for MXM module voltage supply only
Power Consumption	max. 47 W
Temperature Range	Operational: 0°C to +55°C Standard Storage: -40°C to +75°C (500 hours at normal humidity with a 24 hours recovery period at room temperature) **Note:** If a higher operating temperature is required, please contact Kontron for assistance.
Recommended Airflow	Volumetric Flow Rate: 20 cfm **Note:** Sufficient airflow must be provided to ensure optimal operation and long-term reliability of the CP6-GPU8860.
Board Weight	800 grams (with cooling solution)

For further information on the features and the operation of the CP6-GPU8860, refer to the previous chapters in this manual. For information on the AMD Radeon E8860 GPU module, refer to the AMD Radeon E8860 Embedded GPU product brief on the AMD website.

5.2.1 Display Support on the CP6-GPU8860

The CP6-GPU8860 supports the following multiple-display configuration.

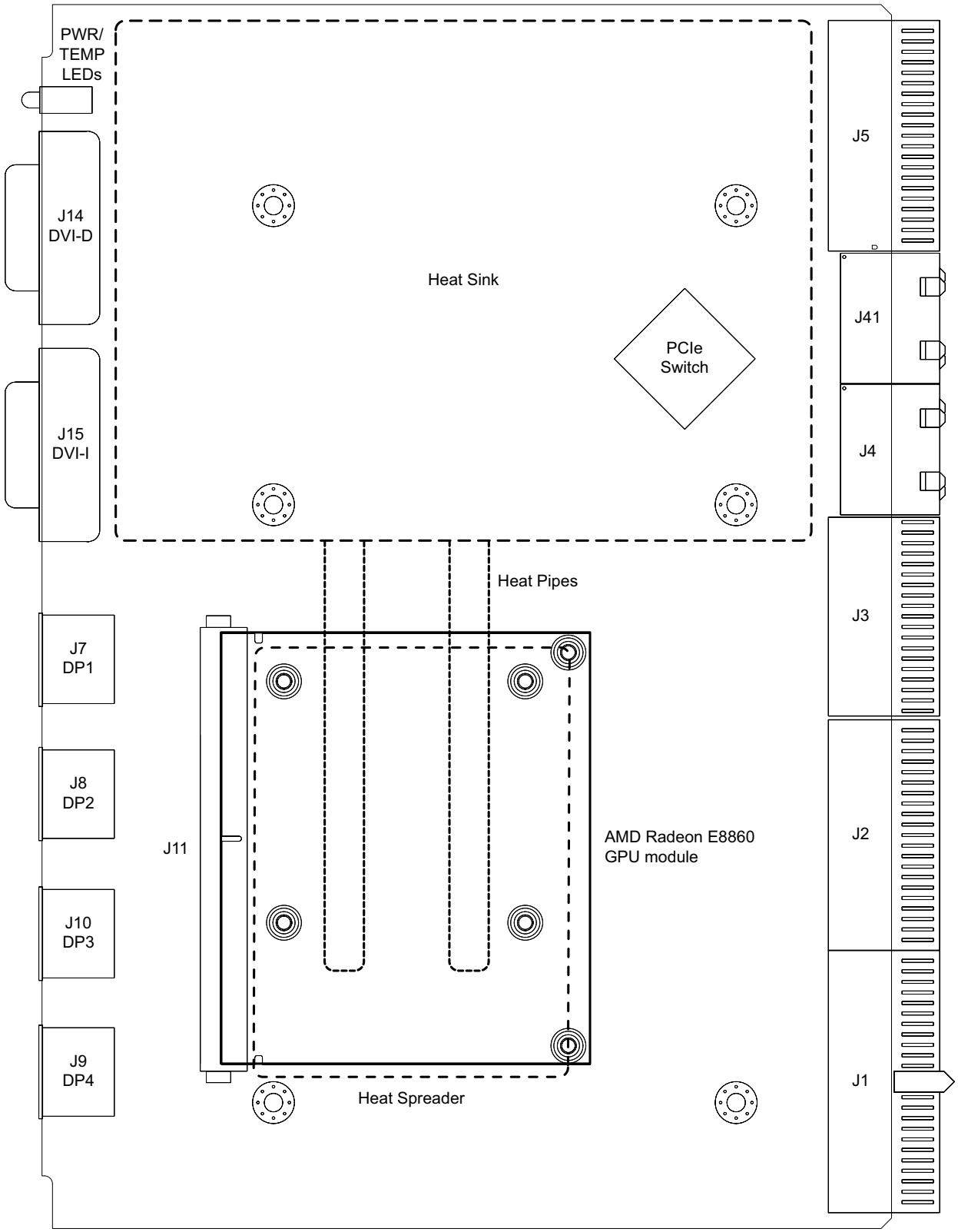
Table 17: CP6-GPU8860 Display Support

AMD Radeon E8860 Function	DP_A	DP_B	DP_C	DP_D	LVDS_L	--
CP6-GPU8860 Front Panel Interface	DVI-I	DP_2	DP_1	DP_3	DVI-D	DP_4

Note: The DisplayPort DP4 is not supported by the AMD Radeon E8860 GPU module.

5.3 CP6-GPU8860 Board Layout

Figure 5: CP6-GPU8860 Board Layout (Top View)



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