MPMC-9337-2000

3U VPX 3-Slot Compact Signal/Image Processing System

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Key Features

- 3U VPX backplane
- Cold-plate cooling
- SWaP-optimized
- Configuration
  - 1 x 3U VPX SBC
  - 1 x 3U VPX GPGPU
  - Dual channel CAN/MilCAN offload controller
  - 2 or 4 x 1000BASE-T Ethernet ports
  - 4 x 10GBASE-SR Fiber Ethernet ports
  - 1 x spare 3U VPX slot
- 28 VDC input

Applications

- Signals Intelligence
- Radar
- Airborne or ground vehicles

Overview

The Curtiss-Wright Defense Solutions MPMC-9337-2000 is a leading-edge, flexible, and rugged high-performance signal and image processing system which can be readily configured to meet the needs of any military or aerospace requirement, from laboratory to harsh deployed ground vehicle environments.

The MPMC-9337-2000 uses advanced packaging techniques to integrate the latest 3U VPX Intel® based single board computers (SBC), such as the VPX3-1220 and VPX3-1260, as well as an NVIDIA® Turing™ GPGPU in a rugged enclosure. Measuring only 250 cubic inches, this compact enclosure is able to operate and survive external temperatures of 71°C, achieving full performance at temperatures in excess of 55°C using cold-plate cooling. This enables system designers to implement and deploy a highly capable processing system without the need for fans, vehicle-supplied air, liquid, or other demands from the vehicle.

Standard Configuration

The standard configuration of the MPMC-9337-2000 includes a 28 VDC PSU, an SBC, a GPGPU, and a quad-channel 10 Gigabit Ethernet interface module.

The chassis includes a spare multi-function 3U VPX slot that supports another PCIe module or dedicated 3U SATA storage module. The SATA storage module can accommodate a 2.5” SSD with drives up to 8TB currently available (AES-256 options available).

Technology

The MPMC-9337-2000 utilizes cold-plate cooling technology to keep the temperature rise of the payload cards at a minimum. The Curtiss-Wright boards in the system utilize a combination of thermal management layers within the Printed Wiring Board (PWB) and aluminum and copper thermal frames that provide cooling paths for mezzanine cards and high-powered components, such as the processor and bridge devices. Heat is transferred from the modules to the chassis via the thermal interface of the modules’ heat-frame and wedgelocks.

From there, the heat is channeled to the chassis outer wall and then to the chassis base where it is dissipated into the cold-plate to which the chassis is fixed using captive, high-strength mounting bolts.

To ensure the highest levels of performance, the system chassis has been designed to meet or surpass MIL-STD-810 Qualifications for military equipment. The system has successfully passed environmental qualification tests, including but not limited to temperature, altitude, shock, vibration, fluid susceptibility, voltage spikes, and electrostatic.

Circuit cards installed in the sealed compact chassis are completely isolated from external environmental conditions such as humidity, dust, and sand.

Filters on power inlet and I/O signals, as well as EMC gaskets around every chassis joint, provide excellent resistance to external EMI and minimize emissions providing improved reliability.

INFO: CURTISSWRIGHTDS.COM
EMAIL: DS@CURTISSWRIGHT.COM

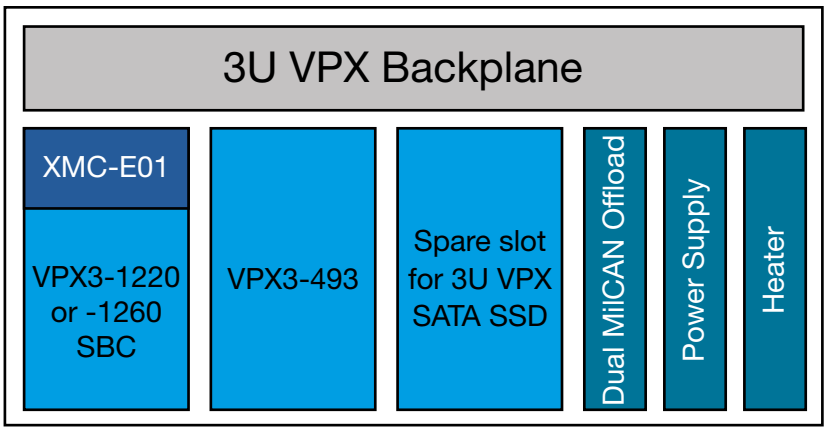

Figure 1: MPMC-9337-2000 Block Diagram

Specifications

Dimensions

- Dimensions (L x W x H): 9.3 x 5.5 x 4.9” (236.22 x 139.70 x 124.46 mm)
- Mass: 14 lb (6.35 kg)
  - Configured with a typical SBC and VPX3-493 GPGPU 3U OpenVPX modules and XMC-E01

Power

- 180W, cold-plate at 55°C

Temperature

- Cold-plate: -40 to 55°C

Interfaces

- External Interfaces
  - 4 x 10GBASE-SR Ethernet
  - 4 x 1000BASE-T* Ethernet (VPX3-1220)

    or
  - 2 x 1000BASE-T* Ethernet (VPX3-1260)
  - 2 x MilCAN/CAN
  - 2 x GPGPU DVI
  - 2 x USB2
  - 2 x RS422
- Internal Debug Interfaces: accessible with the rear cover removed, breakout cable required, available separately
  - 3 x USB 2.0
  - 2 x EIA-232
  - 2 x DVI (1 x SBC, 1 x GPGPU)

* Ethernet is 1000BASE-T only – contact factory for more information and other options

Development Support

To support the use of the system in a development environment, the BCS-P-9335 (Bench Cooling System – Passive) convection baseplate assembly is available from Curtiss-Wright. The baseplate assembly allows the system to be attached using the standard mounting bolts and provides sufficient cooling for full power operation in a normal lab or office environment. Breakout cable assemblies are also available for the front panel 38999 connectors (CBL-FPSET-9337-01) as well as for the internal debug connector (CBL-DBG-9335-01).

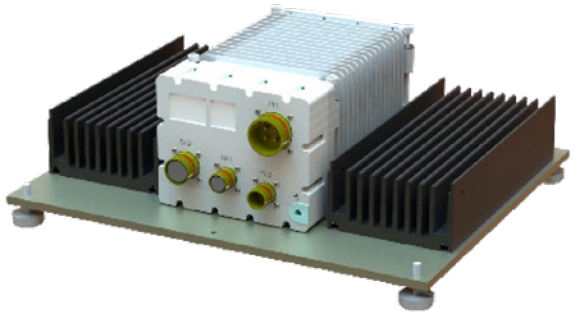

Figure 2: System with bench cooling system

Qualification

The MPMC-9337 is based on a chassis which has been tested to the standards shown below.

In addition, the VPX3-1220, VPX3-1260, VPX3-493 and XMC-E01 have been through Curtiss-Wright's own Level 200 Environmental Qualification process. Click here to see details on our ruggedization levels.

The MPMC-9337 is well suited for applications in challenging environments that have high mechanical shock requirements and a need for a very low EM emissions profile.

TABLE 1 Target Environment

PARAMETER	SEVERITY	ENVIRONMENTAL
Temperature	-46 to +55°C Baseplate temperature	DEF-STAN 00-35 Part 3 Issue 4 Test CL5, CL2
Humidity		DEF-STAN 00-35 Part 3 Issue 4 Test CL6
Salt fog		DEF-STAN 00-35 Part 3 Issue 4 Test CN2
Low pressure	4000 m (61.6 kPa)	DEF STAN 00-35, Part 3, Issue 4, Ch3-21, S4.2, Proc A
Altitude	12,192 m (18.8 kPa)	MIL-STD-810F 500.4 PII, Operation
Rapid Decompression	2,192 m (18.8 kPa)	MIL-STD-810F 500.4 PIII
Vibration		Def Stan 00-35 Part 3, Issue 4, Test M1 › Tracked Vehicles › Road Transportation › Air Transportation (Jet/Propeller)
Shock	30 g 18 ms	DEF-STAN 00-35 Part 3 Issue 4 Test M3
Ballistic shock	200 g 3 ms	DEF-STAN 00-35 Part 3 Issue 4 Test M3
Sand and dust		DEF-STAN 00-35 Part 3 Issue 4 Test CL25
Immersion	IPX5	IEC 60529
Lightning		STANAG 4236
EMC emissions	DCE01.B, DC02.B, DCE03.B, DRE01.B, DRE02.B	DEF-STAN 59-411 Land Class A, radiated and conducted emissions
EMC susceptibility	DCS01.B, DCS02.B, DCS03.B, DCS05.B, DCS06.B, DRS01.B, DRS02.B, DRS03.B	DEF-STAN 59-411 Land Class A, conducted and radiated susceptibility
ESD	DCS10.B	DEF-STAN 59-411, ISO 10605
Other		Automotive EMC Directive, 2004/104/EC

Ordering Information

Please contact the factory.