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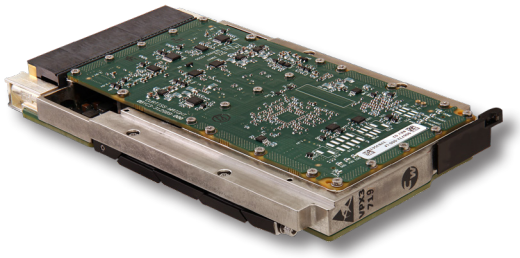
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Find the *Curtiss-Wright VPX3-719* at our website: ***Click HERE***

VPX3-719

Safety Certifiable 3U VPX AMD E8860 Graphics and Video Capture Module

CURTISSWRIGHTDS.COM



Key Features

- AMD Radeon E8860 GPU
  - + 2 GB dedicated video memory
  - + H.264 codec for accelerated video encode and decode
- Up to six independent display outputs
  - + 4 x DVI directly from the GPU
- Customizable video inputs and outputs
  - + Dual independent video output channels (2 x HD-SDI, 1 x analog)
  - + Dual independent video input/ capture channels (2 x HD-SDI, 2 x analog)
- RTOS driver support for Power Architecture®, Intel® and Arm® processors
- OS support for Linux®, Wind River® VxWorks®, GHS® INTEGRITY®, LynxOS® and Microsoft® Windows®
- Hardware and software certifiable with DO-254 and DO-178C certification artifact kits available

Applications

- Subsystems requiring highly reliable graphics generation and display
- Applications such as moving maps, SVS/DVE, or GIS
- Graphics systems requiring safety certification

Overview

The VPX3-719 is an industry-leading rugged 3U OpenVPX™, high performance graphics processing combination module based on the AMD Radeon™ E8860 Graphics Processing Unit (GPU) with video capture and support for HD-SDI video interface. This single-slot module is targeted at avionics applications where a cost effective COTS alternative to custom developed DO-254/DO-178 safety certifiable solutions can offer a competitive advantage for integrators.

The E8860 is the latest embedded discrete GPU from AMD that meets the long lifecycle availability required for military programs through the use of a suite of CoreAVI® software drivers and 20-year component supply program. It features up to six independent and simultaneous graphics outputs, 2 GB of dedicated video memory, and video compression encoder and decoder.

The module incorporates a Curtiss-Wright Personality Module mezzanine for video capture and format conversions, which provides two channels of video capture from analog and HD-SDI video sources, and transfers this video data directly to processor or GPU memory. On the output side, it converts two DVI video streams from the GPU into HD-SDI or analog outputs. This combination of functionality provides for extremely low latency capture, graphics generation and overlay, and display output conversion.

The VPX3-719's large complement of dedicated video memory, combined with its high performance, make it ideal for use in demanding graphics-rich applications that require extensive video processing and display capabilities. Designed for high reliability and a long lifecycle, the VPX3-719 module is especially well-suited to support embedded training, moving maps, Geographic Information Systems (GIS), 360 degree situational awareness, Degraded Visual Environment (DVE) and other graphics, video and compute-intensive applications. This module has been designed for safety certifiable applications, and has been developed to meet the needs of DO-254 and DO-178C. Full sets of certifiable artifacts are available from Curtiss-Wright.

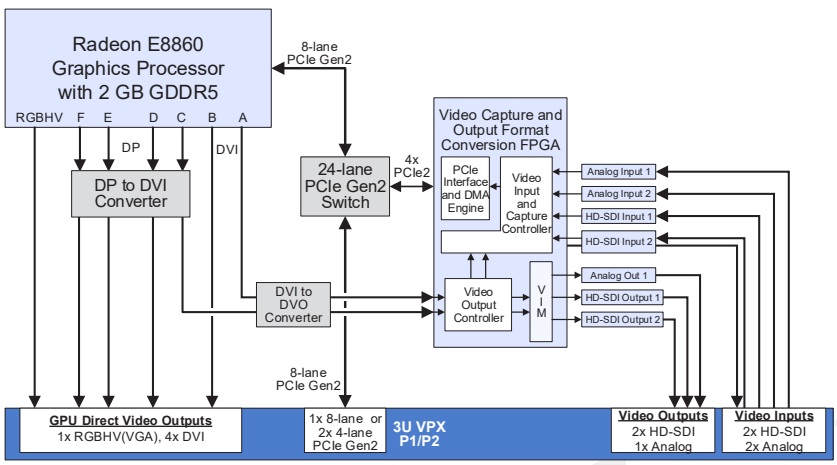


Figure 1: VPX3-719 block diagram

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Specifications

Form factor

- 3U OpenVPX with Personality Module mezzanine
  - + Basecard supports module format MOD3-PAY-1D, MOD-PAY-2F, and MOD-PER-2F
  - + VITA 46-, VITA 48-, and VITA 65-compliant

Graphics processor

- AMD Radeon E8860 GPU
- Graphics memory: 2 GB GDDR5 SDRAM (72 GBps)
- Host interface: 8-lane PCI Express® (PCIe) Gen2
- Supports CoreAVI HyperCore™ graphics hypervisor GPU manager
- Supports CoreAVI TrueCore™ GPU safety monitor for avionics Design Assurance Level (DAL) A certification

Video output

- Up to six independent simultaneous outputs on the basecard, selectable from:
  - + 4 x GPU-direct DVI outputs
    - › Single-link DVI, 162 MPps, up to 1920 x 1200 @ 60 Hz
  - + 1 x analog RGBHV output
- Two independent video outputs selectable from:
  - + 2 x HD-SDI
  - + 1 x analog PAL/NTSC, STANAG 3350 class B/C, RGBHV

Video capture

- Two simultaneous capture streams selectable from:
  - + 2 x HD-SDI, with one HD-SDI active loopthrough
  - + 2 x analog PAL/NTSC, STANAG 3350 class B/C, RGBHV

Power

- Typical: 30W
- Max: 47W

Note: The graphics drivers include support for power management which can be utilized to reduce overall power consumption

Software support

- CoreAVI drivers available for OpenGL® 1.3, OpenGL ES 2.0, OpenGL SC 1.0, and OpenGL SC 2.0
- Support for Built-in Test (BIT)
- Operating system support for Linux, VxWorks®, Microsoft® Windows®
- Safety Certifiable Operating Systems – Wind River® VxWorks 653, Green Hills® INTEGRITY-178, LynxOS-178

Environmental

- Conduction-cooled Level 200
- Air-cooled and Air-flow Through (AFT) – contact factory

Weight

- Conduction-cooled, Level 200: 800 g

Safety Critical Applications

DO-254/DO-178C certification can be a costly and time consuming undertaking especially if it's new to your organization. For years, Curtiss-Wright Defense Solutions has invested heavily in its people and infrastructure to efficiently deliver products for safety critical applications. Through hands-on experience with DO-254/DO-178C projects, Curtiss-Wright has developed COTS graphics modules and single board computers (SBCs) that are certifiable up to DAL C, with re-usable design artifacts to help reduce your certification risk and project costs and accelerate your time to market. The VPX3-719 is one of our latest safety certifiable graphics modules.

Certification must be done on the platform as a whole, not simply on its sub-parts. However, each part of the platform must be safety certifiable individually to attain the final certification. Our certifiable COTS building blocks products can be used as-is, or modified to meet your unique hardware and software requirements and Curtiss-Wright can provide the appropriate planning and design documents to support your certification effort.

DO-254 certifiability

The VPX3-719 is designed using a development process that results in a DO-254 DAL C certifiable product and supporting artifacts.

According to RTCA/DO-254 Appendix A for DAL C, the following list shows the documents that are considered as deliverable items and can be ordered as a Safety Certifiable Artifact Kit from Curtiss-Wright.

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Deliverables for certification

- Plan for Hardware Aspects of Certification including Validation and Verification Plan
- Top-Level Drawing
- Hardware Accomplishment Summary

Support documents for certification

(if requested by authorities)

- Hardware Design Plan
- Hardware Validation Plan
- Hardware Configuration Management Plan
- Hardware Requirements
- Hardware Design Data
- Assembly Drawings/Installation Control Drawings
- Hardware Traceability Data
- Hardware Review and Analysis Results
- Hardware Test Procedures
- Hardware Test Results

DO-178C Certifiability

Curtiss-Wright works with leading OS and software partners to develop board-specific support for the VPX3-719. Drivers and support for safety certifiable operating systems, such as Wind River VxWorks 653, LynxOS-178, or Green Hills INTEGRITY-178 are developed in partnership to ensure our customers DO-178C requirements are met.

DO-178C certification artifacts up to DAL A are also available from Curtiss-Wright.

Unified Video Decoder

The VPX3-719 supports a Unified Video Decoder (UVD) which provides hardware codec decompression of H.264 and MPEG2 video streams. Up to two 1080p streams can be supported, including support for Multi-view Video Coding (MVC) that is commercially used in 3D Blu-ray.

At lower resolutions, the design handles up to 10 streams simultaneously with the total resolution not greater than the equivalent of two HD decodes.

Video Compression Encoder

The E8860 includes hardware support for H.264 video compression.

PCIe Fabric Ports

The VPX3-719 provides one 8-lane or two 4-lane PCIe Gen2 ports to the backplane. All lanes are routed to the P1 backplane connector and follow the pinout as defined by OpenVPX VITA 65.

Driver Software Support

The VPX3-719 is supported by CoreAVI's suite of embedded software drivers, including ArgusCore (OpenGL 1.3, OpenGL ES 2.0, OpenGL SC 1.0, OpenGL SC 2.0), DecodeCore (H.264/MPEG 2 video decode), EncodeCore (H.264 encode), TrueCore (GPU safety monitor) and HyperCore (Hypervisor and multicore support). The CoreAVI software drivers are designed to enable advanced graphics, video support and power management on all popular real-time and safety-critical operating systems. These drivers are available directly from Curtiss-Wright, simplifying procurement and support with a single point of contact.

The drivers also include an extensive library of BIT.

Rear Transition Module

To gain access to the backplane I/O signals of the VPX3-719, the RTM3-719 rear transition module (RTM) is available to access I/O in a lab environment.

Variants and Customization

Curtiss-Wright also has a Modified COTS (MCOTS) program where standard COTS products can be modified for simple changes such as matching existing system pinouts, or up to more complex modifications like form factor and/or functional customizations. Please contact Curtiss-Wright to discuss your program requirements.

Ruggedization Levels

Conduction-cooled cards are available in Level 200. Curtiss-Wright can also support air-cooled and draft VITA 48.8 AFT formats. Please contact Curtiss-Wright if additional ruggedization level support is required.

Ordering Information

The VPX3-719 is ordered with the following part numbers. Not all possible configurations are offered. Please consult Curtiss-Wright for available configurations.

TABLE 1	Ordering information - VPX3-719-ctmxzz
PART NUMBER	AVAILABLE OPTIONS AND DESCRIPTION
VPX3-719-A0mxzz	Air-cooled Level 0, 0 to 50°C
VPX3-719-A1mxzz	Air-cooled Level 100, -40 to 71°C
VPX3-719-C2mxzz	Conduction-cooled Level 200, -40 to +85°C card edge
VPX3-719-F1mxzz	Air-flow Through, Level 100, -40 to 71°C
m	Mechanical format 4: 1.0” pitch, no 2-level maintenance covers 5: 1.0” pitch, 2-level maintenance covers
x	Mezzanine configuration 1: IPX-274 Personality Module installed 9: Custom configuration
zz	Functional configuration 00: Unique configuration

Ordering configurations

A summary of popular ordering configurations are shown below. For other models or configurations, consult Curtiss-Wright for availability.

TABLE 2	Ordering configurations
PART NUMBER	DESCRIPTION
VPX3-719-C24100	4 x DVI outputs, 2 x HD-SDI or analog outputs, 2 x HD-SDI or analog capture, conduction-cooled Level 200

TABLE 3	Accessories
PART NUMBER	DESCRIPTION
RTM3-719-001	Rear Transition Module for the VPX3-719

Software

Please contact Curtiss-Wright for software driver ordering details.

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