XMC-A2000E-FGX2-CV

NVIDIA RTX A2000 with Converted Video Outputs

IN DEVELOPMENT

KEY FEATURES

- NVIDIA RTX™ GA107, 2560 CUDA cores, 80 Tensor cores, 20 RT cores, peak performance 8.25 TFLOPS*
- Up to 4 independent video outputs
- SDI, CVBD, DisplayPort/HDMI/DVI supported
- 8 GB GDDR6 memory, 128 Bit, 192 GB/s max
- Configurable operating power, 25W to 80W
  *Peak performance requires the highest power configuration mode

GPU / FGX2 FEATURES

- DisplayPort 1.4 digital video outputs with support for 4K at 120Hz/5K at 60Hz, 10-bit color depth
- Up to 2 SDI outputs
- Up to 2 CVBS/RGB outputs
- Ampere GPGPU parallel processing support:
  - ☐ CUDA® Toolkit 11, CUDA Compute capability 8.6
  - ☐ OpenCL™ 3.0, DirectX® 12 Ultimate, OpenGL 4.6, OpenGL ES 3.2, Vulkan™ 1.2
  - ☐ GPUDirect support
- 80 Tensor Cores (3rd Gen), 34/66 TOPS (dense/sparse)
- 20 Ray Tracing cores (2nd Gen)
- NVENC (7th Gen) and NVDEC (5th Gen) with up to 8K video encoding and hardware decoding support

CONNECTIVITY/SYSTEM MANAGEMENT

- PCIe x8; GPU supports up to Gen4, XMC connector and carrier will determine maximum throughput
- Linux and Windows drivers available

MECHANICAL/ARCHITECTURE

- Designed for Harsh Environments:
  - ☐ Rugged conduction cooled or air cooled
  - ☐ Operating temperature: conduction cooled -40° to +85°C, air cooled -40° to +71°C
  - ☐ Vibration (sine wave): 10G peak, 5 - 2000Hz
  - ☐ Shock: 40G peak for conduction cooled, 30G peak for air cooled
- Dimensions: TBD
- Weight (approximately): TBD
- VITA 46.9 I/O mapping for VPX rear I/O

OVERVIEW

This XMC module includes an advanced NVIDIA RTX™ A2000 embedded GPU and a WOLF FGX2 for video format conversion to SDI and analog formats. Data can be routed to the high-performance NVIDIA Ampere architecture GPU for processing, encoding, or AI inference, and then be output using the XMC connector or front panel connectors.

The NVIDIA Ampere architecture has introduced many significant improvements to the performance and efficiency of the GPU, with more flexible CUDA FP32/INT core use, more efficient third generation Tensor cores, and second generation RT cores. The Ampere GPU fabrication uses an 8nm manufacturing processing providing significant power improvements which, along with other Ampere architecture improvements, can provide up to 144 GFLOPS/W, providing almost three times the performance per slot compared to the Pascal generation's 51 GFLOPS/W.

The WOLF Frame Grabber eXtreme (FGX2) provides the board with data conversion from one standard to another, with a wide array of video input and output options for both cutting-edge digital I/O and legacy analog I/O. The FGX2 supports NVIDIA GPUDirect which allows direct access to the GPU memory for processing and analysis.

Unlocking the best performance requires the best cooling capability. WOLF's advanced cooling technology is designed to move heat using a low weight, high efficiency path to move heat away from the GPU.

NVIDIA RTX

This information is subject to change.

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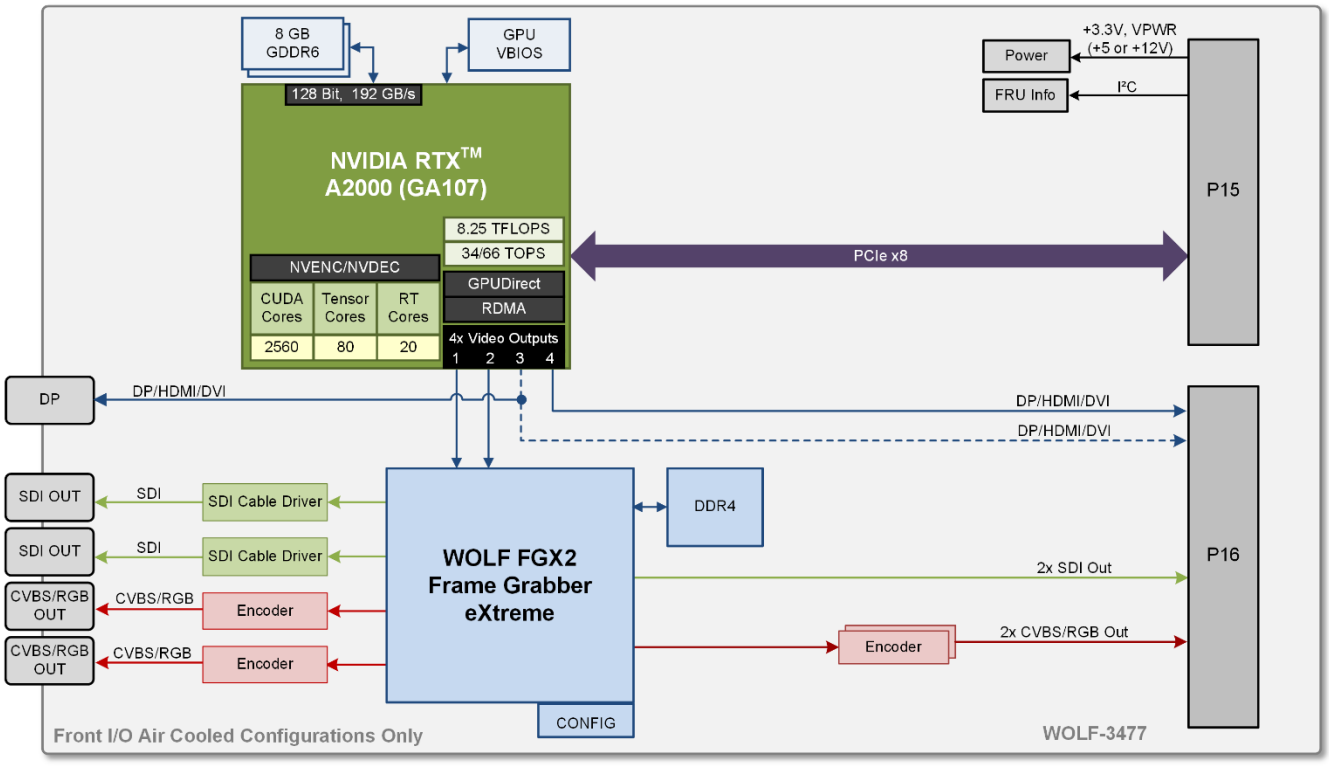

NVIDIA AMPERE STREAMING MULTIPROCESSOR (SM)

Each NVIDIA Ampere streaming multiprocessor (SM) partition contains CUDA cores for FP and INT operations, Tensor cores for AI, Ray Tracing (RT) cores for rendering, Texture Units, a register file, and L1/Shared Memory. Previous generation SM partitions limited one of the two available data paths to integer operations. With the Ampere SM both data paths can be used to process FP32 operations, providing double the number of available CUDA cores per SM for FP32. This change along with many other improvements to the other components in the Streaming Multiprocessor allows Ampere GPUs to provide significant performance per watt improvements.

NVIDIA TENSOR CORES FOR ARTIFICIAL INTELLIGENCE AND HPC

Tensor Cores are designed to speed up the tensor / matrix computations used for deep learning neural network training and inferencing operations. Ampere GPUs include the third-generation Tensor Core design which supports many new data types for improved performance, efficiency, and programming flexibility, including a new sparsity feature and a new Tensor Float 32 (TF32) precision mode.

NVIDIA provides CUDA-X AI and CUDA-X HPC libraires which have been designed to work with NVIDIA Tensor Core GPUs to provide the tools needed to accelerate development of applications for AI and HPC.

HARDWARE ACCELERATED VIDEO ENCODE / DECODE

The NVIDIA Ampere architecture GPU includes the NVENC video encode (version 7.2) and NVENC decode (version 5) hardware acceleration engine. Using the Ampere GPU for video encoding provides an efficient, high quality method to achieve real time 8K and 4K encoding without burdening the system CPU. The Ampere decoding engine includes support for several popular codecs and is the first GPU to include AV1 hardware decoding support. The NVIDIA Video Codec SDK provides a complete set of APIs, samples and documentation for hardware accelerated video encode and decode.

This information is subject to change.

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IN DEVELOPMENT

ORDERING CODES

The following table defines series of common order codes for the XMC-A2000E-FGX2-CV module. The asterisks denote characters of the part number that are defined based on common configuration options. Some common configuration options for this module include:

- Display Interfaces
- Conformal Coating Options
- XMC 1.0, 2.0 or other (ANSI/VITA 88)
- Air or Conduction Cooled

Ordering Number	Description
Example XMC-A2000E-FGX2-CV Configurations	
347722-F***-***vA0	XMC 2.0 (PCIe Gen3 support), Air Cooled, Ampere A2000; front: 1x DP, 1x SDI, 1x CVBS
347732-F***-***vA0	XMC 2.0 (PCIe Gen3 support), Conduction Cooled, Ampere A2000; rear: 2x SDI, 2x CVBS
347721-F***-***vA0	XMC 1.0 (PCIe Gen2 support), Air Cooled, Ampere A2000; front: front: 1x DP, rear 2x SDI
347731-F***-***vA0	XMC 1.0 (PCIe Gen2 support), Conduction Cooled, Ampere A2000; rear: 2x SDI, 1x DP, 2x CVBS

* Contact WOLF to determine the appropriate configuration for your system.

MANUFACTURING AND QUALITY ASSURANCE

WOLF designs modules to pass the following environmental standards:

- MIL-STD-810 (United States Military Standard for Environmental Engineering Considerations and Laboratory Tests)
- MIL-HDBK-217 (Reliability Prediction of Electronic Equipment)
- RTCA DO-160 (Environmental Conditions and Test Procedures for Airborne Equipment) on request

WOLF complies with the following management systems:

- AS9100D: Quality Management System - Requirements for Aviation, Space and Defense Organizations (certified)
- ISO 9001:2015: Quality management systems (certified)
- AS5553: Counterfeit Electronic Parts; Avoidance, Detection, Mitigation, and Disposition (compliant)
- NIST SP 800-171: Protecting Controlled Unclassified Information in Nonfederal Systems (compliant)

Boards are manufactured to meet the following standards:

- IPC-A-610 CLASS 3 (Acceptability of Electronic Assemblies)
- IPC 6012 CLASS 3 (Qualification and Performance Specification for Rigid Printed Boards, Class 3 for High Reliability Electronic Products)
- IPC J-STD-001 (Requirements for Soldered Electrical and Electronic Assemblies)

AS9100 • ISO 9001 CERTIFICATION Intertek

ITAR Free

GOVERNMENT-INDUSTRY DATA EXCHANGE PROGRAM GIDEP

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Datasheet Rev.3