MOSARC 3D GRAPHICS PROCESSING UNIT MODULE

Safety-critical 3D graphics processing

3D graphics rendering for third-party developers

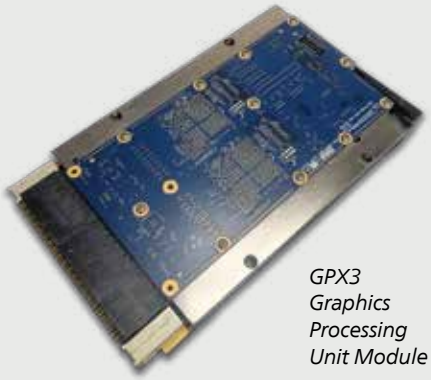
Collins Aerospace's Mosarc® product line is built on a modular open system approach (MOSA) to enable rapid, seamless integration with Collins and external vendor avionics. The Mosarc Graphics Processing Unit (GPU) Module features a single or dual AMD Radeon™ E9171 multi-chip module – provides safety-critical 3D image generation via our OpenGL SC 2.0.1 driver and library.

The Mosarc GPU and drivers are the same as those used in Collins' Combined Vision System (CVS) and Enhanced Vision System (EVS) capabilities featured on our Head-Up Displays (HUDs) and Primary Flight Displays (PFDs). Due to the safety-critical nature of the technology, the OpenGL driver is developed to meet the DO-178C Level A standard and the image library meets DO-178C Level B standards.

The Mosarc GPU and drivers can be configured to provide up to ten individual display outputs, at resolutions up to 4K. The GPX3 supports 4-lane widths on select outputs with multiple transmission speeds including RBR (1.62 Gb/sec), HBR (5.4 Gb/sec), and HBR2 (5.4 Gb/sec). The processor interface is a 4-lane wide PCIe Gen 3.0 interface.

The Mosarc GPU Module comes with an OpenGL driver and library to assist third-party developers in managing GPU interrupts and maintaining the graphics device resources. The library contains an application programming interface (API) to render images. The driver provides the interface between the library and GPU. The library and driver report errors to the host application through APIs.

As an integral part of Collins' line of commercial avionics, we actively manage and protect stock quantities to mitigate obsolescence risk. All of our modules contain Collins developed firmware, portable/reusable platform software, middleware and application software components.



GPX3 Graphics Processing Unit Module

KEY FEATURES & BENEFITS

- HOST/SOSA-aligned, 3U OpenVPX module
- Features up to two AMD Radeon E9171 GPUs
- DO-254 hardware and DO-178C OpenGL SC 2.0.1 driver and library for safety-critical OpenGL graphics
- High-technology readiness level (TRL) hardware and software
- Available in a Collins customized 3U OpenVPX development station with breakouts of major interfaces for early development

Model: GPX3

FIRMWARE

- GPU – AMD embedded Radeon E9171
- Module Manager (MM) – GPX3 includes a module manager field programmable gate array (FPGA) that uses system management bus (SMBus) protocols to send health data to the chassis manager on the SCX3

CORE PLATFORM SOFTWARE

- OpenGL SC 2.0.1 device driver abstracts the details of the GPU interface from applications
- MM FPGA driver pulls/pushes data from/to the SMBus

CORE MIDDLEWARE

- OpenGL SC 2.0.1 enables applications to control the E9171 features and outputs

SPECIFICATIONS

- 14nm FinFET GCN4.0 architecture with up to two E9171 devices, with each device featuring:
  - Eight compute units: 1.25 TFLOPS
  - 4 GB DDR5 memory: 128-bit wide
  - Graphics clock 1,124 MHz
  - Memory clock 1,500 MHz
- 8 MBit PROM for GPU BIOS storage
- Heater included to support operation down to -40°C
- Each GPX3's E9171 can be configured to five DP outputs:
  - DPE supports up to a four-lane width
  - DPA and DPB can be independently configured as 1- or 2-lane widths
  - DPC and DPD each support a one-lane width
- Vsync in/out capability
- SWaP
  - Size: 3U OpenVPX form factor (100mm x 160mm)
  - Weight: 0.95 lb.
  - Power: 30.5 W (typical)

APPLICABLE RELEASES

- 983-9131-210 (complete module assembly with GPX3 CCA, heatsink and wedgelocks)

Specifications subject to change without notice.

Collins Aerospace
An RTX Business

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