IC-GRA-XMCd
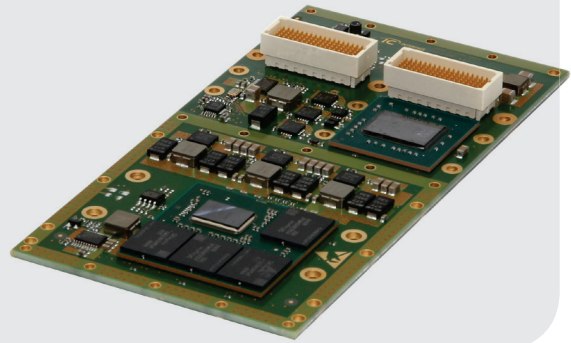## AMD E9171GPU XMC board

- *XMC 1.0 (VITA42) or XMC2.0 (VITA61)*
- *AMD Radeon™ E9171 GPU/GPGPU*
- *PCI Express x8 Gen2 or Gen3*
- *3 DisplayPort video outputs*
- *OpenGL™ 4.5*
- *HDMI to ARINC 818 converter*

The **IC-GRA-XMCd** is both a new generation of GPU and GPGPU XMC board and an HDMI to ARINC 818 or 3G-SDI converter when populated with the on-board Xilinx Kintex® UltraScale™ FPGA. It does then meets the performance and functionalities needed for today's avionic and defense applications.

Description

Taking advantage of the 1.2 TFLOPS computing capacities provided by the AMD Radeon™ E9171 GPGPU, the **IC-GRA-XMCd** doubles the performance versus previous versions while maintaining the TDP at less than 40 watts.

The **IC-GRA-XMCd** is available in 2 configurations:
• an XMC1.0 VITA 42 compliant board, with x8-lane PCI Express Gen2 interfaces offering a backward compatible with the former Interface Concept Graphic XMC modules (optional).
• an XMC2.0 VITA 61 compliant board offering a x8-lane PCI Express Gen3 interface bus to the host.

The AMD embedded Radeon™ E9171 takes advantage of the Polaris architecture and brings a range of improvements in the 14nm technology microchip versus earlier GPU generations. With 8 CUs and 4GB video memory, this power efficient and advanced 3D graphics engine supports Microsoft® DirectX® 12 technology for superior graphics rendering.

In addition, its dedicated Unified Video Decoder (UVD) and 4K HEVC/H.265 Video Encoding acceleration enables High Definition decode of H.264, VC-1, MPEG4, MPEG2 and MVC compressed video streams.

The AMD multi-display controllers deliver up to 36-bpp (bits per pixel) throughout the display pipes allowing the **IC-GRA-XMCd** to leverage up to five independent Displays. The support of OpenGL™4.5 and OpenCL™2.0 as an open standard programming software, makes this XMC module the ideal solution for demanding graphics and video applications in low power environments.

With the on-board Xilinx Kintex® UltraScale™ FPGA and the ARINC 818 or 3G-SDI video interface, the **IC-GRA-XMCd** offers a concentration of technology to Interface Concept Intel-based SBCs. It is a high performance video device for the aerospace community able to transfer ultra-high-definition packets over 8 PCIe Gen lanes.
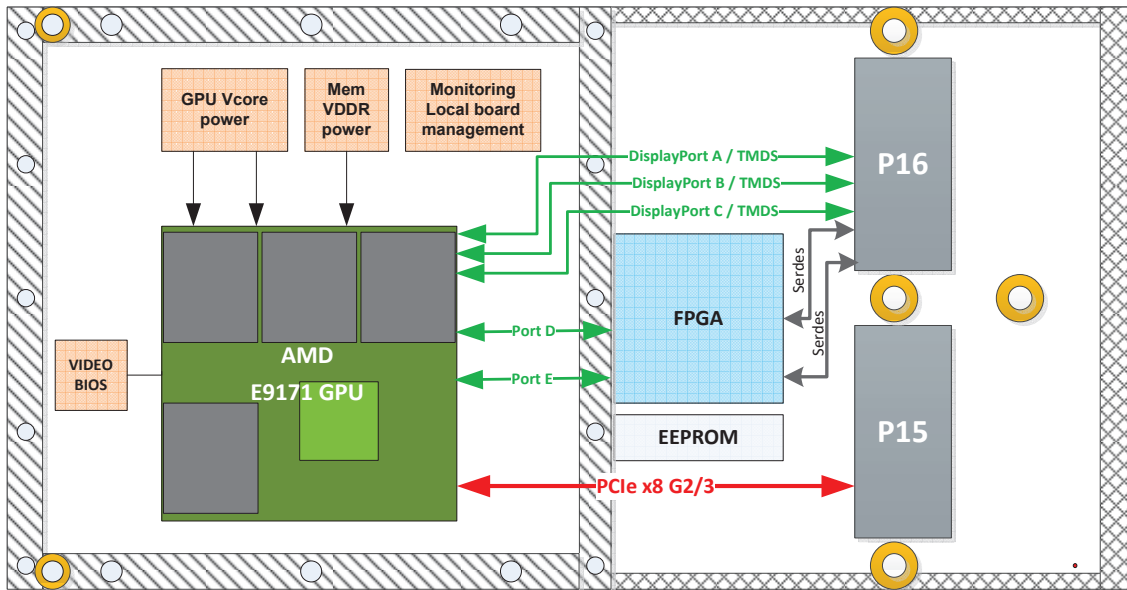
The **IC-GRA-XMCd** is available in conduction-cooled grade.

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Block Diagram

Main features

XMC interfaces

XMC P16

 • **3 display outputs (ports A, B and C)** each with the following pixel display resolution and timing:

- **DisplayPort 1.4**
  - one 5120 × 2880 px @ 60 Hz refresh rate (dual-cable configuration) or
  - one 5120 × 2880 px @ 60 Hz refresh rate (single-cable configuration) or
  - up to three 3840 × 2160 px @ 60 Hz refresh rate or
  - up to three 4096 × 2160 px @ 60 Hz refresh rate

  The above ports can also be used with DisplayPort++ to HDMI (or DVI) adapters (active or passive) to allow connection with HDMI or DVI Displays, offering thus:

- **HDMI™ 2.0b (6 Gbit/s)**
  - up to three 3840 × 2160 px @ 60 Hz refresh rate, or
  - up to three 4096 × 2160 px @ 60 Hz refresh rate (outputs)

- **Dual-link DVI**
  - one 2560 × 1600 px @ 60 Hz refresh rate, or
  - one 1920 × 1200 px @ 60 Hz refresh rate

- **Single-link DVI**
  - up to three 1920 × 1200 @ 60 Hz refresh rate

• **2 optional ARINC 818 or 3G-SDI Interfaces (ports D, E)** (*)

(*) Please provide us with your ICD (Interface Control Documentation)

XMC P15

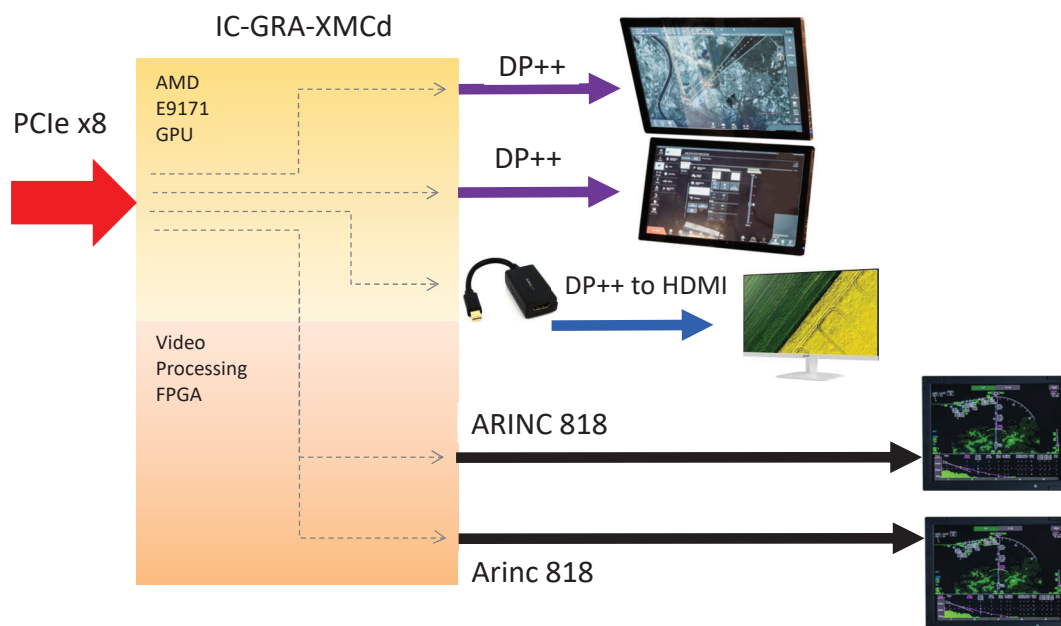 • **PCI Express x8 lanes Gen2/Gen3**

Graphic processing unit

- AMD embedded Radeon™ E9171 GPU/GPGPU
- 8 Compute Units (CU)
- 1.2 TFLOPS
- 4GB on-chip GDDR5 memory (1GHz 128-bit)

Interface features

- XMC1.0 – VITA 42.0 – 10mm stack (optional)
- XMC2.0 – VITA 61.0 – 12 mm stack (factory settings)

Case study

IC-GRA-XMCd

PCIe x8

AMD E9171 GPU

Video Processing FPGA

DP++

DP++

DP++ to HDMI

ARINC 818

Arinc 818

In this case, the solution takes advantage of the 2 Display Port interfaces of the 9171 GPU for very high resolution displays.

The third DP++ port is used with a DP++ to HDMI converter to attach an HDMI Display.

In addition, thanks to the logic conversions provided by the FPGA, one of the two ports attached to the FPGA is converted into an ARINC818 flux duplicated on two differnt interfaces to remote displays.

Grades

Criterion	Coating	Operation Temperature	Rec. Airflow	Oper. HR% no cond.	Storage Temperature	Sinusoidal Vibration	Random Vibration	Shock 1/2 Sin. 11ms
Conduction-Cooled 71°C	Yes	-40 to 71°C at th thermal interface (*,	-	5 to 95%	-45 to 100°C	5G [20..2000]Hz	0.05g2 /Hz [10..2000]Hz	40G
Conduction-Cooled 85°C	Yes	-40 to 85° C at the thermal interface (*)	-	5 to 95%	-45 to 100°C	5G [20..2000]Hz	0.1g2 /Hz [10..2000]Hz	40G

(*) : Temperature grades are subject to availability according to IC products. Please consult us.

All information contained herein is subject to change without notice.

For more information, please contact:

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