

M599

AMD E9171 (Polaris) GPGPU and Graphics XMC



Aitech's M599 5-Head Multiple Output Graphics XMC provides a high-performance, Low Power Consumption, highly versatile embedded video and graphics solution for harsh environment applications.

Based on Radeon™ E9171, AMD “Polaris” architecture, 5-Head GPU with its 4 GB of GDDR5, the M599 is ideal for avionics and defense applications.

The M599 support video decode and encode for 4K support at 60 Hz and High Efficiency Video Coding (HVEC), H.265

Availability of certifiable OpenGL® graphics libraries with data packages to support DAL A certification



RuggedAI™ is Aitech

- Rugged XMC Form Factor
- AMD Radeon E9171 (Polaris) GPU
 - ▶ 1.2 TFLOPS GPU
 - ▶ 5 Independent Graphics Heads
 - ▶ 4GB GDDR5
 - ▶ Dynamic Power Management (DPM)
 - ▶ GPGPU Parallel Processing
 - ▶ 4K HEVC/H.265 and AVC/H.264 decode and encode
- Vulkan, OpenCL, OpenGL, DirectX
- Up to 4 x 4K and 5 x 3K Video Outputs
- PCIe x8 Gen3 Host Interface
- Low Power Consumption
- Windows™, Linux™, VxWorks™, Integrity™
- VITA61 complaint
- Conduction and Air-Cooled Versions
- VITA47
- Vibration and Shock Resistant



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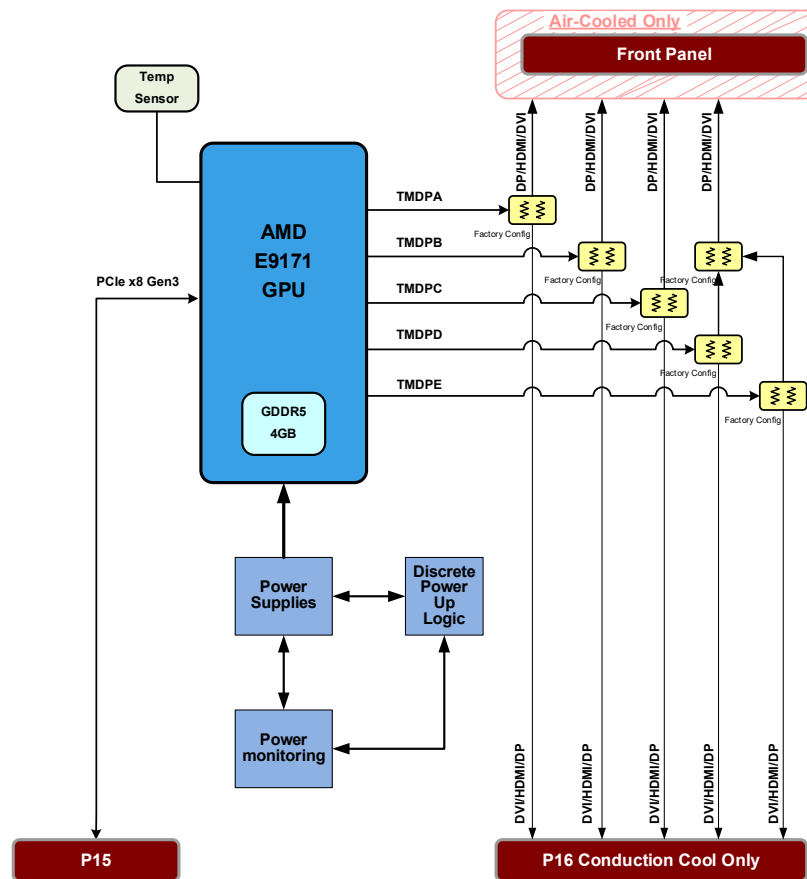
The parallel processing capabilities of today's multi-core GPUs make them ideal for both non-graphics and graphics applications with intensive computation requirements. Aitech's M599 General Purpose GPU (GPGPU) board provides these capabilities, as well as high-performance graphics rendering capabilities and multiple video output channels, in a rugged XMC form factor.

In addition to the increased throughput offered by parallel processing, GPGPU computing also allows the CPU and OS to remain responsive even when the system is under a heavy load, by offloading the intensive operations to the GPU.

The M599 hosts an AMD E9171 (Polaris) GPU, and new configurations of the M599 are released as higher-performance GPUs become available.

The M599 operates as a peripheral XMC board with a compatible x86 or NXP host SBC.

M599 and the host SBC interconnect via a high speed PCIe Gen3 link of up to 8 lanes.



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Board Architecture

GPU	<ul style="list-style-type: none">• AMD Radeon E9171 (Polaris)• 5 Independent Graphics Heads• Embedded GPU 1.2 TFLOPS• 4 GB GDDR5 @ 1500 MHz• Eight compute units, 512 shaders	<ul style="list-style-type: none">• Vulkan, DirectX®12, OpenGL 4.5, OpenCL 1.2• 4K HEVC/H.265 and AVC/H.264 decode and encode, 4K support at 60Hz
PCIe Interface	• PCIe x8 host interface supporting Gen3 speed	
Board Resources	<ul style="list-style-type: none">• On-board Temperature Sensor• On-board Status Indicator LEDs	

Cooling & Video Outputs

	Video Outputs Variants	
	A0	A1
Air-Cooled Video Outputs to front panel	<u>4 x Display Port</u> Up to 4096 x 2160 @ 60 Hz	<u>4 x DVI/HDMI</u> DVI* - up to 1600 x 1200 @ 60 Hz HDMI - up to 4096 x 2160 @ 60 Hz
Conduction-Cooled Video Outputs to P16 connector	R0 <u>5 x Display Port</u> up to four 4096 x 2160 @ 60 Hz or up to five 3840 x 2160 @ 60	R1 <u>5 x DVI/HDMI</u> DVI* - up to 1600 x 1200 @ 60 Hz HDMI – up to four 4096 x 2160 @ 60 Hz or up to five 3840 x 2160 @ 60

* Contact an Aitech representative for Dual Link configuration

Software

Operating System Support	Windows, Linux, VxWorks* and Integrity*
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* Contact an Aitech representative for VxWorks and Integrity support.

Mechanical

	Form Factor & Dimensions	Weight
Air-Cooled	Single-Width XMC per ANSI/VITA 61	<200 g [0.45 lbs]
Conduction-Cooled	Single-Width XMC per ANSI/VITA 61	<200 g [0.45 lbs]

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Power

Typ.	20W
Max.	40 W
Input Voltage	+3.3V, VPWR (Universal +5V/+12V)

Environmental

Specs per VITA 47	Air-Cooled			Conduction-Cooled	
	Commercial	Rugged	Military	Rugged	Military
Operating Temp.	AC1 (0 to +55°C) ⁽¹⁾	AC3 (-40 to +70°C) ⁽¹⁾	AC4 (-40 to +85°C) ⁽¹⁾	CC3 (-40 to +70°C) ⁽²⁾	CC4 (-40 to +85°C) ⁽²⁾
Non-Operating Temp.	C1 (-40 to +85°C)	C3 (-50 to +100°C)	C4 (-55 to +125°C)	C3 (-50 to +100°C)	C4 (-55 to +125°C)
Vibration	V1	V2	V2	V3	V3
Operating Shock	OS1	OS1	OS1	OS2	OS2
Altitude	15,000 ft.	35,000 ft.	70,000 ft.	35,000 ft.	70,000 ft.
Relative Humidity ⁽³⁾	0 - 90%	0 - 95% with Acrylic (Standard),			
Conformal Coating	N/A	0 - 100% with Urethane (Optional)			

Notes: (1) Operating ambient air temperature (with sufficient airflow)

(2) Operating card edge temperature

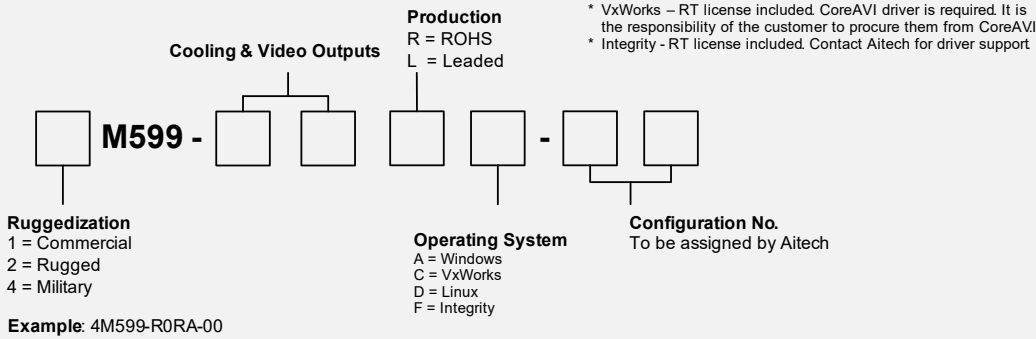
(3) Non-condensing

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Ordering Information



RuggedAI™ is Aitech

Optional Accessories

- TM599** Rear Transition Module (RTM) providing convenient access to M599 I/O interfaces via standard connectors. Supports both air and conduction-cooled M599 when installed in a compatible system. See the TM599 datasheet for more information.

Contact Aitech

Contact your Aitech sales representative for additional product information, and for inquiries regarding customized configurations of the M599 and additional software support.

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