



Benefits

1. Flexible Partitioning

Mali-G78AE incorporates a new “Flexible Partitioning” feature that enables up to 4 fully independent partitions for true workload separation. Flexible Partitioning allows the allocation of dedicated hardware resources to different workloads, for the full separation of safe and non-safe, or time sensitive, workloads.

2. Safety Features

Following Arm’s functional safety development process, Mali-G78AE is designed to ISO 26262 and IEC 61508 standard and is safety-capable to ASIL B / SIL 2 diagnostic requirements and ASIL D / SIL 3 for the avoidance of systematic failure.

Arm has worked with our ecosystem partner CoreAVI to bring safety to Mali-G78AE software, to ensure support for the latest safety critical APIs alongside standard high performance drivers.

Overview

The Arm Mali-G78AE GPU is a second generation Valhall architecture-based GPU and the first to be developed for autonomous use cases to suit both automotive and industrial markets.

Mali-G78AE incorporates the new Flexible Partitioning feature to enable up to four fully independent partitions for workload separation. It allows the allocation of dedicated hardware resources to different workloads for the full separation of safe, non-safe, or time-sensitive workloads. This provides the ability to share IP resources across multiple virtual machines (VMs) in a safe and secure manner – a key requirement for complex autonomous applications.

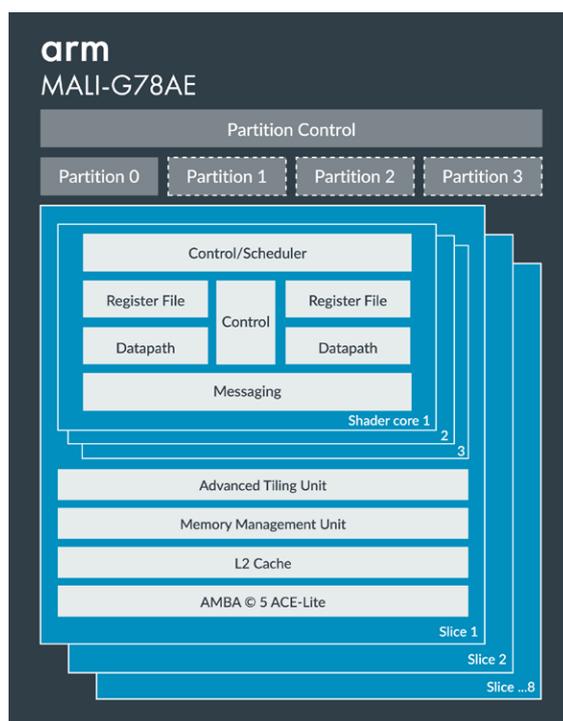
Mali-G78AE introduces new hardware support for virtualization, enabling direct access for up to 16 VMs to share GPU resources in a standard time-slicing approach, and be fully compatible with Flexible Partitioning. This is further enhanced by new system interfaces to minimize software complexity and integration in virtualized systems.

Safety Ready

Mali-G78AE is part of Arm’s Safety Ready portfolio and follows the stringent Arm functional safety development process. Mali-G78AE is designed to the ISO 26262 and IEC 61508 standards and is safety-capable to ASIL B/SIL 2 diagnostic requirements, allowing deployment for safe human machine interfaces (HMI) and providing the heterogenous compute needed in autonomous systems. In addition, Arm has worked with our ecosystem partner, CoreAVI, to ensure the latest safety critical APIs are supported with a driver developed to target ASIL D.

Learn more at www.arm.com/safety





Specifications

Features	Value	Description
Anti-aliasing	4x MSAA 8x MSAA 16x MSAA	4x Multi-Sampling Anti-Aliasing (MSAA) with minimal performance drop.
API support	OpenGL® ES 1.1, 2.0, 3.1, 3.2 Vulkan 1.1, 1.2 OpenCL™ 1.1, 1.2, 2.0 Full profile OpenGL ® SC 1.0, 2.0	Full support for next-generation and legacy 2D/3D graphics applications.
Bus Interface	AMBA®5 ACE, ACE-LITE, and AXI	Compatible with a wide range of bus interconnect and peripheral IP.
L2 cache	Configurable 256KB – 4MB	1 to 8 slices
Scalability	1 core to 24 cores	Configurable from 1 core to 24 cores delivering the largest capability for a Mali GPU.
Adaptive Scalable Texture Compression (ASTC)	Low Dynamic Range (LDR) and High Dynamic Range (HDR). Supports both 2D and 3D images.	ASTC offers several advantages over existing texture compression schemes by improving image quality, reducing memory bandwidth and thus energy use.
Arm Frame Buffer Compression (AFBC)	Version 1.3 4x4 pixel block size	AFBC is a lossless image compression format that provides random access to pixel data to a 4x4 pixel block granularity. It is employed to reduce memory bandwidth both internally within the GPU and externally throughout the SoC.

Related Products

Cortex-A78AE

With the flexibility to run different workloads concurrently and a 30 percent performance uplift compared to its predecessor, Cortex-A78AE offers the scalable, heterogeneous compute required for complex automated driving and industrial autonomous systems.

Mali-C71AE

As an advanced high-performance ISP, Mali-C71AE delivers key visual information to both computer vision systems and human display for clear and convenient viewing. Mali-C71AE is the first Arm ISP with built-in features for functional safety.

CoreLink CMN-600AE

High performance coherent mesh network supporting up to ASIL D/SIL 3 safety requirements for a wide range of automotive and industrial applications, featuring CCIX enabled coherent multichip support, quality-of-service (QoS), and flexible system-level cache.

Corelink GIC-600AE

Arm's newest, interrupt controller, the GIC-600AE is fully software compatible with the GIC-600 and is engineered with safety mechanisms to meet demanding safety requirements up to and including ASIL D/SIL 3. The GIC-600AE supports the GIC v4 standard and is the interrupt controller of choice for the Mali-G78AE.

CoreLink MMU-600AE

MMU-600AE enables high performance virtualization for a wide range of automotive applications with safety mechanisms to meet safety requirements up to ASIL D/SIL 3. It is software compatible with MMU-600 and supports the MMU v3.1 architecture.



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