PRODUCT OVERVIEW

The AMD Embedded G-Series SOC platform is a high-performance, low-power System-on-Chip (SOC) design, featured with enterprise-class error-correction code (ECC) memory support, dual and quad-core variants, integrated discrete-class GPU and I/O controller on the same die.

The AMD G-Series SOC achieves superior performance per watt in the low-power x86 microprocessor class of products when running multiple industry standard benchmarks.¹ This helps enable the delivery of an exceptional HD multimedia experience and provides a heterogeneous computing platform for parallel processing. The small-footprint, ECC-capable SOC sets the new foundation for a power-efficient platform for content-rich multimedia processing and workload processing that is well-suited for a broad variety of embedded applications.

SUPERIOR PERFORMANCE PER WATT

The AMD Embedded G-Series SOC platform delivers an exceptionally high-definition visual experience and the ability to take advantage of heterogeneous computing while maintaining a low-power design.

> AMD G-Series SOC’s next-generation “Jaguar” based CPU offers 113% improved CPU performance vs. AMD G-Series APU and greater than a 2x (125%) advantage vs. Intel Atom when running multiple industry-standard compute-intensive benchmarks.²

> AMD G-Series SOC’s advanced GPU, supporting DirectX® 11.1, OpenGL 4.2 and OpenCL™ 1.2¹, enables parallel processing and high-performance graphics processing that provides up to 20% improvement vs. AMD G-Series APU and a 5x (430%) advantage vs. Intel Atom when running multiple industry-standard graphics-intensive benchmarks.³

> Excellent compute and graphics performance with enhanced hardware acceleration delivers up to 70% overall improvement vs. AMD G-Series APU and over 3x (218%) the overall performance advantage vs. Intel Atom in embedded applications when running multiple industry-standard compute- and graphics-intensive benchmarks.⁴

ENABLING LOW-POWER, INNOVATIVE SMALL FORM FACTOR DESIGNS

The AMD G-Series SOC is a small footprint and low-power solution that reduces overall system costs.

> The SOC design offers 33% footprint reduction compared to AMD G-Series APU two-chip platform⁵, simplifying design with fewer board layers and simplified power supply.

> AMD G-Series SOC enables fan-less design that further helps drive down system cost and enhance system reliability by eliminating moving parts.

> With an array of performance options, the AMD G-Series SOC platform allows OEMs to utilize a single board design to enable solutions from entry-level to high-end.

> The SOC design enables new levels of performance in small SBC (single board computer) and COMs (computer-on-modules) form factors.

OPTIMIZING BUSINESS VALUE

The AMD Embedded G-Series SOC platform brings performance and efficiency with desirable features, delivering lower TCO and higher ROI.

> Supporting ECC memory, AMD G-Series SOC platforms will help to penetrate markets previously inaccessible to x86 products in these power envelopes, at this price point.

> The AMD G-Series SOC helps achieve higher system quality, reliability, and energy efficiency, which contribute to overall lower TCO.

> Multiple performance levels offer upgrade paths to protect software and hardware ecosystem costs.

> AMD’s standard embedded 5 year availability and support (additional 2 years under contract possible) maximizes ROI.

> The AMD G-Series SOC platform is well-suited for low-power and high-performance designs in a broad range of markets including Industrial Control & Automation, Digital Signage, Thin Client, Electronic Gaming Machines, and SMB storage appliances.

AMD Embedded G-Series System-on-Chip (SOC)

THE EMBEDDED EVOLUTION CONTINUES WITH X86 CPU, INTEGRATED DISCRETE-CLASS GPU AND I/O CONTROLLER ON THE SAME DIE
KEY ARCHITECTURE BENEFITS

FIRST GENERATION SOC DESIGN
> Delivers up to 70% overall improvement over AMD G-Series APU
> Integrates Controller Hub functional block as well as CPU+GPU+NB
> 28nm process technology, 24.5mm x 24.5mm BGA package

“JAGUAR” CPU CORE WITH PERFORMANCE INCREASES
> Dual-core and quad-core, up to 2MB shared L2
> 113% CPU performance improvement over AMD G-Series APU

NEXT GENERATION GRAPHICS CORE WITH PERFORMANCE INCREASE OVER PREVIOUS GENERATIONS
> 20% compute performance improvement over AMD G-Series APU when running multiple industry-standard graphics-intensive benchmark
> DirectX® 11.1 graphics support

IMPROVED POWER SAVING FEATURES
> Power gating added to Multimedia Engine, Display Controller & NB
> DDR P-states for reduced power consumption

MEMORY SUPPORT: SINGLE-CHANNEL DDR3
> Up to DDR3-1600 – 1.35V and 1.25V voltage levels supported
> Up to 2 UDIMMs or 2 SO-DIMMs
> ECC support

INTEGRATED DISPLAY OUTPUTS
> Supports two simultaneous displays
> Supports 4-lane DisplayPort 1.2, DVI, HDMI™ 1.4a
> Integrated VGA
> Integrated eDP or 18bpp single channel LVDS

UPDATED I/O (FEATURES MAY BE SKU DEPENDENT)
> Four x1 links of PCIe® Gen 2 for GPPs
> One x4 link of PCIe Gen 2 for discrete GPU
> 8 USB 2.0 + 2 USB 3.0
> 2 SATA 2.x/3.x (up to 6Gb/s)
> SD Card Reader v3.0 or SDIO controller

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<th>OPN</th>
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<th>GPU FREQ. (GRAPHICS)</th>
<th>DDR SPEED</th>
<th>USB 3.0</th>
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ARCHITECTURAL OVERVIEW OF THE AMD G-SERIES SOC

1ST GENERATION APU SOC DESIGN
> Integrates Controller Hub functional block as well as CPU+GPU+NB
> 28nm process technology, FT3 BGA package, 24.5mm x 24.5mm
> Dual- or Quad-“Jaguar” CPU cores with 2MB shared L2 cache

NEXT GENERATION GRAPHICS CORE
> Compute performance (GFLOP) improvement
> DirectX® 11.1 graphics support

MEMORY SUPPORT: SINGLE-CHANNEL DDR3
> Up to 2 UDIMMs or 2 SO-DIMM DDR3-1600 @ 1.35V & 1.25V
> Support for ECC DIMMs

INTEGRATED DISPLAY OUTPUTS
> Supports two simultaneous displays
> Supports 4-lane DisplayPort 1.2, DVI, HDMI™ 1.4a, Integrated VGA and Integrated eDP or 18bpp single channel LVDS

UPDATED I/O
> Four x1 links of PCIe® Gen 2 for GPPs
> One x4 link of PCIe Gen 2 for discrete GPU (not on lower TDPs)
> 8 USB 2.0 + 2 USB 3.0
> 2 SATA 2x3 (up to 6Gb/s)
> SD Card Reader v3.0 or SDIO controller

HIGH PERFORMANCE BOX PC WITH AMD G-SERIES SOC

*Compared to AMD Embedded G-Series APU

1 The low-power x86 microprocessor class includes: GX-420CA @ 25W TDP (scored 19); GX-415GA @ 15W (25), GX-415GA @ 15W (17), GX-217GA @ 15W (9), Intel Atom N270 ® @ 2.5W (20), Intel Atom D525 ® @ 15W (12) & Intel Celeron GA40 @ 25W (5). Performance score based on an average of scores from the following benchmarks: Sandra Engineering 2011 Dhyrstone ALU, Sandra Engineering 2011 Whetstone (ISSE3, 3DMark® 06 (1280 x 1024), PassMark Performance Test 7.0 2D Graphics Mark, and EEMBC CoreMark Multi-thread. All systems running Windows® 7 Ultimate for Sandra Engineering, 3DMark® 06 and PassMark. All systems running Ubuntu version 11.10 for EEMBC CoreMark.

2 AMD GX-415GA scored 206, AMD G-T56N scored 98, and Intel Atom D525 scored 93, based on an average of Sandra Engineering 2011 Dhyrstone, Sandra Engineering 2011 Whetstone and EEMBC CoreMark Multi-thread benchmark results. AMD G-T56N system configuration used Xbase M958 motherboard with 4GB DDR3 and integrated graphics. AMD GX-415GA system configuration used AMD "Larne" Reference Design Board with 4GB DDR3 and integrated graphics. Intel Atom D525 system configuration used MSI MS-A923 motherboard with platform integrated 1GB DDR3 and integrated graphics. All systems running Windows® 7 Ultimate for Sandra Engineering and Ubuntu version 11.10 for EEMBC CoreMark.

3 AMD GX-415GA scored 864, AMD G-T56N scored 724, and Intel Atom D525 scored 182, based on an average of 3DMark® 06 (1280 x 1024) and PassMark Performance Test 7.0 2D Graphics Suite benchmark results. AMD G-T56N system configuration used Xbase M958 motherboard with 4GB DDR3 and integrated graphics. AMD GX-415GA system configuration used AMD "Larne" Reference Design Board with 4GB DDR3 and integrated graphics. Intel Atom D525 system configuration used MSI MS-A923 motherboard with platform integrated 1GB DDR3 and integrated graphics. All systems running Windows® 7 Ultimate with DirectX® 11.0.

4 AMD G-Series SOC FT3 BGA package dimension 24.5mm x 24.5mm = 600.25 mm² SOIC. AMD G-Series APU FT1 and Controller Hub two-chip platform: 19mm x 19mm = 361 mm². AMD G-Series APU: 890 mm²: 33% Improvement

5 Based on an average of Sandra Engineering 2011 Dhyrstone ALU, Sandra Engineering 2011 Whetstone (ISSE3, 3DMark® 06 (1280 x 1024), PassMark Performance Test 7.0 2D Graphics Mark, and EEMBC CoreMark Multi-thread. AMD G-T56N system configuration used Xbase M958 motherboard with 4GB DDR3 and integrated graphics. AMD GX-415GA system configuration used AMD "Larne" Reference Design Board with 4GB DDR3 and integrated graphics. All systems running Windows® 7 Ultimate for Sandra Engineering, 3DMark® 06 and PassMark. All systems running Ubuntu version 11.10 for EEMBC CoreMark. All configurations used DirectX® 11.0.

6 Based on an average of Sandra Engineering 2011 Dhyrstone ALU, Sandra Engineering 2011 Whetstone and EEMBC CoreMark Multi-thread benchmark results. AMD G-T56N system configuration used Xbase M958 motherboard with 4GB DDR3 and integrated graphics. AMD GX-415GA system configuration used AMD "Larne" Reference Design Board with 4GB DDR3 and integrated graphics. All systems running Windows® 7 Ultimate for Sandra Engineering and Ubuntu version 11.10 for EEMBC CoreMark.

7 Based on an average of Sandra Engineering 2011 Dhyrstone, Sandra Engineering 2011 Whetstone and EEMBC CoreMark Multi-thread benchmark results. AMD G-T56N system configuration used Xbase M958 motherboard with 4GB DDR3 and integrated graphics. AMD GX-415GA system configuration used AMD "Larne" Reference Design Board with 4GB DDR3 and integrated graphics. All systems running Windows® 7 Ultimate for Sandra Engineering and Ubuntu version 11.10 for EEMBC CoreMark.

8 AMD GX-415GA scored 864, AMD G-T56N scored 162, and Intel Atom D525 scored 162, based on an average of 3DMark® 06 (1280 x 1024) and PassMark Performance Test 7.0 2D Graphics Suite benchmark results. AMD G-T56N system configuration used Xbase M958 motherboard with 4GB DDR3 and integrated graphics. AMD GX-415GA system configuration used AMD "Larne" Reference Design Board with 4GB DDR3 and integrated graphics. Intel Atom D525 system configuration used MSI MS-A923 motherboard with platform integrated 1GB DDR3 and integrated graphics. All systems running Windows® 7 Ultimate with DirectX® 11.0.

9 OpenGL 1.2 currently supported in the following operating systems: Microsoft Windows 7; Microsoft Windows Embedded Standard 7; Microsoft Windows 8; Microsoft Windows Embedded Standard 8; Linux (Catalyst drivers); OpenGL 4.2 currently supported in the following operating systems: Microsoft Windows 7; Microsoft Windows Embedded Standard 7; Microsoft Windows 8; Microsoft Windows Embedded Standard 8; Linux (Catalyst drivers). Ongoing support options TBD.

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