



## AMD EMBEDDED SOLUTIONS: Product Selection Guide

### AMD Embedded: The Next Generation of Embedded Computing

AMD helps deliver the right balance of CPU, GPU and chipset capabilities, to give designers the solutions they need to create the next generation of embedded applications. Along with a broad range of varied solutions, AMD supports the x86 embedded marketplace with design tools and technology partnerships that offer simplicity and flexibility to help create high-performance, feature-rich, and customer-driven products. AMD has long been a leader in innovation with its continued focus on improving both x86 processor and graphics processor designs. AMD's embedded products offer designers a balanced foundation for overall system performance with the quick time-to-market typically offered by commercial off-the-shelf components. AMD embedded solutions give designers ample flexibility to design scalable, x86-based, cost-efficient and feature-rich products, and help drive energy conservation into their systems without compromising application performance or compatibility, graphics performance or features. AMD technology-based products are leading edge from enterprise-class servers and consumer systems to traditional embedded markets.

This brochure presents the full array of AMD's embedded solutions that help deliver maximum performance with low overall system power consumption and are supported by longer than standard availability<sup>1</sup>, a full library of x86 software development applications, and hardware tools. It's time to design and produce the next-generation embedded systems your customers demand — quickly, easily, and efficiently.

### AMD's unique processor designs help deliver high performance and balanced system design.

AMD's range of embedded solutions provides flexible features and a balanced performance approach for the overall system.

#### FEATURES INCLUDE

- > Integrated low power processor and GPU<sup>2</sup>
- > Industry-leading performance-per-watt
- > Native eight-core processor design provides highly scalable performance gains within a consistent thermal envelope
- > Lead-free, four-layer processes with maximum on-board space
- > Efficient heat dissipation reduces or eliminates the need for heat sinks and reduces ambient cooling requirements
- > Range of available packaging and pin counts meets variety of design requirements

Along with these and other technical features, embedded designers can enjoy long-term component availability, comprehensive design support, and AMD's commitment to continue offering new, customer-oriented products.

### Tools and support for developers

AMD offers:

- > A full range of RDK (Reference Design Kit) products designed to enable designers to go from concept to finished product quickly
- > A broad array of development boards for creating efficient x86 system designs
- > Industry collaborations with leading software and hardware specialists, fostering maximum choice for your unique design

### Get to market faster with superior products

Ready to create high-performance, low-power embedded designs that give your innovative new products an edge in the marketplace.

### The AMD Accelerated Processing Unit (APU) Family

AMD APUs are a new approach to processor design and software development, delivering powerful CPU and GPU capabilities for HD, 3D and data-intensive workloads in a single-die processor called an APU. APUs combine high-performance serial and parallel processing cores with other special-purpose hardware accelerators, enabling breakthroughs in visual computing, security, performance-per-watt and device form factor. The first introduction of this technology for embedded applications is the AMD Embedded G-Series Family of APUs, targeted at delivering the ideal combination of price, power and performance for applications such as integrated digital signage, x86 set-top-box (xSTB), xIETV, thin client, point-of-sale, infotainment, and casino gaming, home media servers, industrial control and automation system markets. The new AMD Embedded R-Series platform delivers high-performance processing coupled with a premium high definition visual experience in a solution that is still power efficient. Enabling unprecedented integrated graphics and multi-display capabilities in embedded applications that can be compact and low power.

Note 1: Most models support a planned 5 year availability from Product Release. Check with your local AMD sales rep or distributor for product availability.  
Note 2: On some models.



**The AMD64 embedded family: leading-edge technology for high-end embedded systems**

AMD64 embedded solutions are each uniquely matched to a defined set of product applications. These solutions include high-performance quad-, six- and twelve-core AMD Opteron™ processors and dual-core AMD Turion™ II Neo processors with Direct Connect Architecture for enterprise-class telecom, networking and storage equipment. The ASB1 (BGA) family of processors are designed with unique computing features and a thin, compact form factor to help enable new and uncompromising designs. The ASB2 processors are the second generation BGA platform and are designed to deliver exceptional performance while maintaining low average solution power draw with greater levels of performance and power efficiency over the previous generation ASB1 processor family.

The AMD64 solutions are each uniquely equipped to provide the processing needs for a large number of target markets. These solutions enable unique high-performance, smaller form factor products, with maximum versatility, and minimum design challenge.

**AMD Geode™ LX processors: optimized for low-power, high-performance applications**

AMD Geode™ LX processors are configured to deliver developers a versatile and flexible suite of x86 solutions that enable fast design cycles and short time-to-market roadmaps. Ideal for applications ranging from thin client and set-top boxes to point-of-sale devices and kiosks. AMD has also introduced technology that allows the AMD Geode LX family to use DDR2 memory modules in an existing design. With a minor change in the memory voltage and an updated BIOS, a current AMD Geode LX processor based design can use a DDR2 memory module from Astint which helps ensure memory longevity and results in system level power efficiency. In addition to processors, the family includes a broad range of design tools including Development Boards (DBs) and Reference Design Kits (RDKs) to empower designers to make maximum use of the established world of x86 software applications.

**The AMD Radeon™ embedded graphics family: game-changing graphics for embedded systems.**

AMD Radeon™ graphics for embedded applications are designed to deliver exciting, desktop-level visual experiences to embedded systems. Built with advanced 3D graphics engines supporting Microsoft® DirectX® and OpenGL graphics APIs, AMD graphics solutions enable market-leading, rich, immersive images. Outstanding multimedia capabilities are supported by an integrated multi-standard video decoder delivering enhanced video quality from MPEG-2, H.264 or VC-1 video streams. The ultimate in display flexibility is provided by dual display controllers driving high-resolution displays through VGA, DVI, DisplayPort or HDMI™ interfaces. AMD graphics solutions are designed to perform, engineered to lead and built to win. With a product portfolio including AMD chipsets, discrete graphics processors, MXM modules and PC add-in boards, AMD provides system designers with exciting and innovative graphics solutions for their embedded systems.

# AMD Embedded Solutions

| AMD Opteron™ 6200 Series Embedded Processors - Socket G34 Sixteen-Core and Twelve-Core |                |                          |                |                    |      |  |  |                 |
|--|----------------|--------------------------|----------------|--------------------|------|--|--|-----------------|
| Model  | OPN            | Multi-CPU Scalability    | Core Frequency | Cache              | TDP  | Memory Interface                         | HyperTransport™ Interface                  | Product Release |
| 6274 <sup>1</sup>  | OS6274WKTGGGUS | 16 cores up to 4 sockets | 2.2 / 3.0GHz   | L2 2MB x8; L3 16MB | 115W | DDR3-1600 4-ch Registered ECC & Chipkill | Four 16-lane @ up to 6400MT/s, Full Duplex | Q4-11           |
| 6230 <sup>1</sup>  | OS6230VATCGGUS | 12 cores up to 4 sockets | 2.2 / 3.1GHz   | L2 2MB x6; L3 16MB | 85W  | DDR3-1600 4-ch Registered ECC & Chipkill | Four 16-lane @ up to 6400MT/s, Full Duplex | Q1-12           |

1. Server SKUs. Please contact your AMD sales representative to discuss longevity extensions.

| AMD Opteron™ 6100 Series Embedded Processors - Socket G34 Eight-Core |                |                       |                |                      |      |  |  |                 |
|--|----------------|-----------------------|----------------|----------------------|------|--|--|-----------------|
| Model  | OPN            | Multi-CPU Scalability | Core Frequency | Cache                | TDP  | Memory Interface                         | HyperTransport™ Interface                | Product Release |
| 61K5 <sup>1</sup>  | OE61K5WKT8EGO  | up to 4               | 2.0GHz         | L2 512KB x8; L3 12MB | 115W | DDR3-1333 4-ch Registered ECC & Chipkill | Four 16-lane @ up to 3.2GHz, Full Duplex | Q2-10           |
| 61Q5 <sup>1</sup>  | OE61Q5WKT8EGOE | up to 4               | 2.3GHz         | L2 512KB x8; L3 12MB | 115W | DDR3-1333 4-ch Registered ECC & Chipkill | Four 16-lane @ up to 3.2GHz, Full Duplex | Q2-10           |

1. Server SKUs. Please contact your AMD sales representative to discuss longevity extensions.

| AMD Opteron™ 4200 Series Embedded Processors - Socket C32 Eight-Core and Four-Core |                 |                         |                |                   |     |  |   |                 |
|--|-----------------|-------------------------|----------------|-------------------|-----|--|---|-----------------|
| Model  | OPN             | Multi-CPU Scalability   | Core Frequency | Cache             | TDP | Memory Interface                         | HyperTransport™ Interface                 | Product Release |
| 4280 <sup>1</sup>  | OS4280WL8K8GUS  | 8 cores up to 2 sockets | 3.5GHz         | L2 2MB x4; L3 8MB | 95W | DDR3-1600 4-ch Registered ECC & Chipkill | Two 16-lane @ up to 6400MT/s, Full Duplex | Q4-11           |
| 42MX HE  | OE42MXOHU8K8GUE | 8 cores up to 2 sockets | 3.3GHz         | L2 2MB x4; L3 8MB | 65W | DDR3-1600 4-ch Registered ECC & Chipkill | Two 16-lane @ up to 6400MT/s, Full Duplex | Q4-11           |
| 42DX EE  | OE42DXHKU4K8GUE | 4 cores up to 2 sockets | 3.6GHz         | L2 2MB x2; L3 8MB | 40W | DDR3-1600 4-ch Registered ECC & Chipkill | Two 16-lane @ up to 6400MT/s, Full Duplex | Q4-11           |
| 4256 EE <sup>1</sup>   | OS4256HJU8K8GUS | 8 cores up to 2 sockets | 1.8GHz         | L2 2MB x4; L3 8MB | 35W | DDR3-1600 4-ch Registered ECC & Chipkill | Two 16-lane @ up to 6400MHz, Full Duplex  | Q4-11           |

1. Server SKUs. Please contact your AMD sales representative to discuss longevity extensions.

| AMD Opteron™ 4100 Series Embedded Processors - Socket C32 Six-Core and Four-Core |                |                         |                |                    |     |  |                                   |                 |
|--|----------------|-------------------------|----------------|--------------------|-----|--|-----------------------------------|-----------------|
| Model  | OPN            | Multi-CPU Scalability   | Core Frequency | Cache              | TDP | Memory Interface                         | HyperTransport™ Interface         | Product Release |
| 41KX HE  | OE41KXOHU6DGOE | 6 cores up to 2 sockets | 2.2GHz         | L2 512K x6; L3 6MB | 65W | DDR3-1333 2-ch Registered ECC & Chipkill | Two 16-lane @ 2.2GHz, Full Duplex | Q2-10           |
| 41QS HE  | OE41QS0HU4DGOE | 4 cores up to 2 sockets | 2.5GHz         | L2 512K x4; L3 6MB | 65W | DDR3-1333 2-ch Registered ECC & Chipkill | Two 16-lane @ 2.2GHz, Full Duplex | Q2-10           |
| 41LE HE  | OE41LEOHU4DGOE | 4 cores up to 2 sockets | 2.3GHz         | L2 512K x4; L3 6MB | 65W | DDR3-1333 2-ch Registered ECC & Chipkill | Two 16-lane @ 2.2GHz, Full Duplex | Q2-10           |
| 41GL EE  | OE41GLHKU6DGOE | 6 cores up to 2 sockets | 1.8GHz         | L2 512K x6; L3 6MB | 40W | DDR3-1333 2-ch Registered ECC & Chipkill | Two 16-lane @ 2.2GHz, Full Duplex | Q2-10           |

# AMD Embedded Solutions, cont.

## Six-Core AMD Opteron™ Processors - Socket F (1207)

| Model                | OPN            | Multi-CPU Scalability | Core Frequency | Cache               | TDP  | Memory Interface                        | HyperTransport™ Interface        | Product Release |
|----------------------|----------------|-----------------------|----------------|---------------------|------|---|----------------------------------|-----------------|
| 84QS <sup>1</sup>    | OE84QSWJS6DGNE | up to 8               | 2.4GHz         | L2 512KB x6; L3 6MB | 115W | DDR2-800 2-ch Registered ECC & Chipkill | Three 16-lane@2.2GHz Full Duplex | Q1-10           |
| 84KS HE <sup>1</sup> | OE84KSPDS6DGNE | up to 8               | 2.0GHz         | L2 512KB x6; L3 6MB | 79W  | DDR2-800 2-ch Registered ECC & Chipkill | Three 16-lane@2.2GHz Full Duplex | Q1-10           |
| 24QS <sup>1</sup>    | OE24QSWJS6DGNE | up to 2               | 2.4GHz         | L2 512KB x6; L3 6MB | 115W | DDR2-800 2-ch Registered ECC & Chipkill | Three 16-lane@2.2GHz Full Duplex | Q1-10           |
| 24KS <sup>1</sup>    | OE24KSPDS6DGNE | up to 2               | 2.0GHz         | L2 512KB x6; L3 6MB | 79W  | DDR2-800 2-ch Registered ECC & Chipkill | Three 16-lane@2.2GHz Full Duplex | Q1-10           |
| 14KS <sup>1</sup>    | OE14KSPDS6DGNE | up to 1               | 2.0GHz         | L2 512KB x6; L3 6MB | 79W  | DDR2-800 2-ch Registered ECC & Chipkill | Three 16-lane@2.2GHz Full Duplex | Q1-10           |

1. Temperature is server part.

## Quad-Core AMD Opteron™ Processors - Socket F (1207)

| Model   | OPN            | Multi-CPU Scalability | Core Frequency | Cache        | Peak Power (worst case) TDP | Memory Interface                        | HyperTransport™ Technology       | Product Release |
|---------|----------------|-----------------------|----------------|--------------|-----------------------------|---|----------------------------------|-----------------|
| 83VS    | OE83VSWHP4DGIE | Up to 8               | 2.8GHz         | L2: 512KB x4 | 115W                        | DDR2-800 2-ch Registered ECC & Chipkill | Three 16-lane@2.2GHz Full Duplex | Q3-09           |
| 83QS HE | OE83QSMAP4DGIE | Up to 8               | 2.4GHz         | L3: 6MB      | 71W                         | DDR2-800 2-ch Registered ECC & Chipkill | Three 16-lane@2.0GHz Full Duplex | Q3-09           |
| 23VS    | OE23VSWHP4DGIE | Up to 2               | 2.8GHz         |              | 115W                        | DDR2-800 2-ch Registered ECC & Chipkill | Three 16-lane@2.2GHz Full Duplex | Q3-09           |
| 23QS HE | OE23QSMAP4DGIE | Up to 2               | 2.4GHz         |              | 71W                         | DDR2-800 2-ch Registered ECC & Chipkill | Three 16-lane@2.0GHz Full Duplex | Q3-09           |
| 23KS EE | OE23KSFLP4DGIE | Up to 2               | 2.0GHz         |              | 50W                         | DDR2-800 2-ch Registered ECC & Chipkill | Three 16-lane@1.8GHz Full Duplex | Q3-09           |
| 13QS HE | OE13QSMAP4DGIE | Up to 1               | 2.4GHz         |              | 71W                         | DDR2-800 2-ch Registered ECC & Chipkill | Three 16-lane@2.0GHz Full Duplex | Q3-09           |
| 13KS EE | OE13KSFLP4DGIE | Up to 1               | 2.0GHz         |              | 50W                         | DDR2-800 2-ch Registered ECC & Chipkill | Three 16-lane@1.8GHz Full Duplex | Q3-09           |

## AMD G-Series Accelerated Processing Units

| Model | OPN            | Package                               | CPU Cores | L2 Cache /Core | Memory Interface                    | CPU Core Frequency    | Discrete Class Graphics | GPU Core Frequency | Hardware Video Acceleration <sup>12</sup>            | Graphics   | Display Outputs <sup>13</sup>   | Display Resolutions  | Thermal Design Power | Tdie | Product Release |       |
|-------|----------------|---------------------------------------|-----------|----------------|-------------------------------------|-----------------------|-------------------------|--------------------|--|--|---|--|----------------------|------|-----------------|-------|
| T56N  | GET56NGBB22GVE | FT1 413-pin<br>µBGA 19mm <sup>2</sup> | 2         | 512KB          | DDR3-1333, Unbuffered               | 1.65GHz <sup>17</sup> | AMD Radeon™ HD 6320     | 500MHz             | UVD 3 for H.264, VC-1 and MPEG2 with Blu-ray support | DirectX® 11<br>Shader Model 5<br>OpenCL™ 1.1<br>OpenGL 4.0 | Dual independent display controllers<br>2 active outputs from:<br>1x VGA<br>2x single link DVI<br>1x single link LVDS<br>2x DisplayPort 1.1a<br>1x HDMI<br>1x DVO | VGA: 2560x1600 (HD 6320, HD 6310) or 1920x1200 (HD 6290, HD 6250) 30 bpp<br>Single link DVI: 1920x1200 24 bpp<br>HDMI™: 1920x1080p 36 bpp Single link LVDS™: 1400x1050 18 bpp<br>DisplayPort 1.1a: 2560x1600 (HD 6310) or 1920x1200 (HD 6250) @ 30 bpp | 18W                  | 90°C | Q2-11           |       |
| T52R  | GET52RGG12GVE  |                                       | 1         | 512KB          | DDR3-1333, Unbuffered               | 1.5GHz                | AMD Radeon™ HD 6310     | 500MHz             |  |  |   |  | 18W                  | 90°C | Q2-11           |       |
| T48N  | GET48NGBB22GVE |                                       | 2         | 512KB          | DDR3-1066, Unbuffered               | 1.4GHz                | AMD Radeon™ HD 6310     | 520MHz             |  |  |   |  | 18W                  | 90°C | Q2-11           |       |
| T44R  | GET44RFPB12GVE |                                       | 1         | 512KB          | DDR3-1066, <sup>15</sup> Unbuffered | 1.2GHz                | AMD Radeon™ HD 6250     | 280MHz             | UVD 3 for H.264, VC-1 and MPEG2                      |  |   |  | 9W                   | 90°C | Q2-11           |       |
| T40N  | GET40NFPB22GVE |                                       | 2         | 512KB          | DDR3-1066, <sup>15</sup> Unbuffered | 1.0GHz <sup>17</sup>  | AMD Radeon™ HD 6290     | 280MHz             |  |  |   |  | 9W                   | 90°C | Q2-11           |       |
| T40E  | GET40EFSB22GVE |                                       | 2         | 512KB          | DDR3-1066, <sup>15</sup> Unbuffered | 1.0GHz                | AMD Radeon™ HD 6250     | 280MHz             |  |  |   |  | 6.4W                 | 90°C | Q2-11           |       |
| T40R  | GET40RFSB12GVE |                                       | 1         | 512KB          | DDR3-1066, <sup>15</sup> Unbuffered | 1.0GHz                | AMD Radeon™ HD 6250     | 280MHz             |  |  |   |  | 5.5W                 | 90°C | Q2-11           |       |
| T48L  | GET48LGBB22GVE |                                       | 2         | 512KB          | DDR3-1066, Unbuffered               | 1.4GHz                | N/A                     | N/A                |  |  |   |  | N/A                  | 18W  | 90°C            | Q2-11 |
| T30L  | GET30LGBB12GVE |                                       | 1         | 512KB          | DDR3-1066, Unbuffered               | 1.4GHz                | N/A                     | N/A                |  |  |   |  | N/A                  | 18W  | 90°C            | Q2-11 |
| T24L  | GET24LQFB12GVE |                                       | 1         | 512KB          | DDR3-1066, <sup>15</sup> Unbuffered | 1.0GHz                | N/A                     | N/A                | N/A  |  |   |  | 5W                   | 90°C | Q2-11           |       |

## AMD G-Series Platform Controller Hubs

| Model | OPN        | CPU Interface   | Package                                     | PCI Express® | PCI           | SATA                        | FIS-Based Switching | Ethernet MAC           | USB            | HD Audio         | LPC SPI SMBus | Max GPIOs | APU Fan Control | APU Clock Gen | Power <sup>16</sup> |
|-------|------------|---|---|--------------|---------------|-----------------------------|---------------------|------------------------|----------------|------------------|---------------|-----------|-----------------|---------------|---------------------|
| A50M  | 100-CG2198 | 1X4 Gen 1   | FCBGA 605-pin lidless µBGA 2mm <sup>2</sup> | 4x1 Gen 2    | No            | 6x 6Gb/s                    | No                  | No                     | 14 v2.0 2 v1.1 | Up to 4-channels | Yes           | 102       | Yes             | Yes           | 2.7W-5.9W           |
| A55E  | 100-CG2293 | FCBGA 605-pin lidless µBGA 2mm <sup>2</sup> 1X4 Gen 2 | 23mm FCBGA                                  | 4x1 Gen 2    | 33MHz 4 Slots | 6x 6Gb/s with RAID 0,1,5,10 | Yes                 | Yes (non-EEE PHY only) | 14 v2.0 2 v1.1 | Up to 4-channels | Yes           | 102       | Yes             | Yes           | 2.7W-5.9W           |

12. Refer to the Brazos Platform Minimum System Recommendations for HD Video Playback, order# 48826 to view the minimum system configurations required to enable HD playback and the maximum resolution supported for each advanced video quality feature.

13. Other resolutions available that do not oversubscribe link bandwidth. Display resolutions limited by available memory bandwidth.

14. eDP translator option supporting 2048x1536 (HD 6310) or 1920x1200 (HD 6250) at 18 or 24 bpp.

15. Low voltage (1.35V) DDR3 is assumed for the 9W TDP processors. The use of 1.5V DDR3 will incur a power adder.

16. Configuration dependant. See product databook for configurations.

17. Models enabled by AMD Turbo CORE technology, up to 10% clock speed increase is planned. For CPU boost, only one processor core of a dual-core has boost enabled.

# AMD Embedded Solutions, cont.

## AMD Embedded R-Series APU – FS1r2 PGA

| Model  | OPN            | Package                        | CPU Cores | L2 Cache | Memory Interface  | CPU Core Frequency - P2/P0 | Discrete Class Graphics | GPU Core Frequency Max/Base | Hardware Video Accelerations   | Graphics  | Display Outputs <sup>1</sup>  | Display Resolutions (Maximums)  | Thermal Design Power | Tdie (Max) | Product Release |
|--------|----------------|--------------------------------|-----------|----------|---|----------------------------|-------------------------|-----------------------------|--|---|---|---|----------------------|------------|-----------------|
| R-464L | RE464LDEC44HJE | 1225mm <sup>2</sup><br>722-PGA | 4         | 2MBx2    | 128 Bit organized as two 64 bit channels:<br>DDR3 (1.5V),<br>LVDDR3 (1.35V),<br>ULVDDR3 (1.25V) up to DDR3-1600 | 2.3/3.2 GHz                | AMD Radeon™ HD 7660G    | 686MHz/<br>497MHz           | H.264 Decode (HD+HD up to 1080p and 1080i)<br><br>H.264 encode (baseline+CABAC) 1080p@60Hz<br><br>HW security including AES Decryption | DirectX® 11 Shader Model 5 OpenCL™ 1.1 OpenGL 4.2 | Quad independent display controllers providing 4 active outputs:<br>4x single link DVI<br>4x DisplayPort 1.2 (Requires MST Hub)<br>1x HDMI™<br>1x VGA | DisplayPort/eDP: 4096x2160@30Hz<br>18/24/32 bpp<br><br>Single Link DVI: 1920x1200@60Hz<br>24 bpp  | 35W                  | 100°C      | Q2-12           |
| R-460H | RE460HDEC44HJE |                                | 4         | 2MBx2    |   | 1.9/2.8 GHz                | AMD Radeon™ HD 7640G    | 655MHz/<br>497MHz           | H.264 Decode (HD+HD up to 1080p and 1080i)<br><br>H.264 encode (baseline+CABAC) 1080p@60Hz<br><br>HW security including AES Decryption |   |   | Dual Link DVI: 2560x1600@60Hz<br>1920x1200@60Hz<br>24/30 bpp<br><br>Native HDMI: 1920x1080@60Hz<br>24/30/36 bpp<br>1920x1200@60Hz<br>24 bpp | 35W                  | 100°C      | Q2-12           |
| R-272F | RE272FDEC23HJE |                                | 2         | 1MB      |   | 2.7/3.2 GHz                | AMD Radeon™ HD 7520G    | 686MHz/<br>497MHz           | H.264 Decode (HD+HD up to 1080p and 1080i)<br><br>H.264 encode (baseline+CABAC) 1080p@60Hz<br><br>HW security including AES Decryption |   |   | Type 1 Dual Mode DisplayPort to HDMI Adaptor: 1280x720@60Hz<br>24/30/36 bpp<br>1920x1200@60Hz<br>24 bpp                                     | 35W                  | 100°C      | Q2-12           |
| R-268D | RE268DDEC23HJE |                                | 2         | 1MB      |   | 3.0/2.5 GHz                | AMD Radeon™ HD 7420G    | 640MHz/<br>470MHz           | H.264 Decode (HD+HD up to 1080p and 1080i)<br><br>HW security including AES Decryption   |   |   | Type 2 Dual Mode DisplayPort to HDMI Adaptor: 1920x1080@60Hz<br>24/30/36 bpp<br>1920x1200@60Hz<br>24 bpp                                    | 35W                  | 100°C      | Q2-12           |

## AMD Embedded R-Series APU – FP2 BGA

| Model  | OPN            | Package                       | CPU Cores | L2 Cache | Memory Interface  | CPU Core Frequency - P2/P0 | Discrete Class Graphics | GPU Core Frequency Max/Base | Hardware Video Accelerations   | Graphics  | Display Outputs <sup>1</sup>   | Display Resolutions (Maximums)  | Thermal Design Power | Tdie (Max) | Product Release |
|--------|----------------|-------------------------------|-----------|----------|---|----------------------------|-------------------------|-----------------------------|--|---|--|---|----------------------|------------|-----------------|
| R-460L | RE460LSIE44HJE | 837mm <sup>2</sup><br>827-BGA | 4         | 2MBx2    | 128 Bit organized as two 64 bit channels:<br>DDR3 (1.5V),<br>LVDDR3 (1.35V),<br>ULVDDR3 (1.25V) up to DDR3-1333 | 2.0/2.8 GHz                | AMD Radeon™ HD 7620G    | 497MHz/<br>360MHz           | H.264 Decode (HD+HD up to 1080p and 1080i)<br><br>H.264 encode (baseline+CABAC) 1080p@60Hz<br><br>HW security including AES Decryption | DirectX® 11 Shader Model 5 OpenCL™ 1.1 OpenGL 4.2 | Quad independent display controllers 4 active outputs from:<br>4x single link DVI<br>4x DisplayPort 1.2 (Requires MST Hub)<br>1x HDMI™ | DisplayPort/eDP: 4096x2160@30Hz<br>18/24/32 bpp<br><br>Single Link DVI: 1920x1200@60Hz<br>24 bpp  | 25W*                 | 100°C      | Q2-12           |
| R-452L | RE452LSHE44HJE |                               | 4         | 2MBx2    |   | 1.6/2.4 GHz                | AMD Radeon™ HD 7600G    | 424MHz/<br>327MHz           | H.264 Decode (HD+HD up to 1080p and 1080i)<br><br>H.264 encode (baseline+CABAC) 1080p@60Hz<br><br>HW security including AES Decryption |   |  | Dual Link DVI: 2560x1600@60Hz<br>1920x1200@60Hz<br>24/30 bpp<br><br>Native HDMI: 1920x1080@60Hz<br>24/30/36 bpp<br>1920x1200@60Hz<br>24 bpp | 19W*                 | 100°C      | Q2-12           |
| R-260H | RE260HSHE24HJE |                               | 2         | 2MB      |   | 2.1/2.6 GHz                | AMD Radeon™ HD 7500G    | 424MHz/<br>327MHz           | H.264 Decode (HD+HD up to 1080p and 1080i)<br><br>H.264 encode (baseline+CABAC) 1080p@60Hz<br><br>HW security including AES Decryption |   |  | Type 1 Dual Mode DisplayPort to HDMI Adaptor: 1280x720@60Hz<br>24/30/36 bpp<br>1920x1200@60Hz<br>24 bpp                                     | 17W*                 | 100°C      | Q2-12           |
| R-252F | RE252FSHE23HJE |                               | 2         | 1MB      |   | 1.9/2.4 GHz                | AMD Radeon™ HD 7400G    | 415MHz/<br>333MHz           | H.264 Decode (HD+HD up to 1080p and 1080i)<br><br>HW security including AES Decryption   |   |  | Type 2 Dual Mode DisplayPort to HDMI Adaptor: 1920x1080@60Hz<br>24/30/36 bpp<br>1920x1200@60Hz<br>24 bpp                                    | 17W*                 | 100°C      | Q2-12           |

\*Note: PCIe Gen2 operation adds ~1W to TDP

1. Support for the 4<sup>th</sup> Display Port output requires the use of DisplayPort 1.2 multi-streaming technologies with compatible monitors and/or hubs. The number and types of supported displays may vary by board design.

## AMD R-Series Platform Controller Hubs

| Model | OPN        | CPU Interface                             | Package                    | PCI Express®      | PCI              | SATA                 | FIS-Based Switching  | USB                          | HD Audio         | LPC SPI SMBus | Max GPIOs | APU Fan Control | APU Clock Gen | Power <sup>16</sup>    |
|-------|------------|---|----------------------------|-------------------|------------------|----------------------|----------------------|------------------------------|------------------|---------------|-----------|-----------------|---------------|------------------------|
| A70M  | 100-CG2389 | Unified Media Interface (UMI) x4 Gen1 +DP | 656-BGA 600mm <sup>2</sup> | 4 x1 or 1x4 Gen 2 | No               | 6x 6Gb/s RAID 0,1    | No                   | 4 v3.0<br>10 v 2.0<br>2 v1.1 | Up to 4-channels | Yes           | 32        | Yes             | Yes           | Configuration Specific |
| A75   | 100-CG2386 | Unified Media Interface (UMI) x4 Gen1 +DP | 656-BGA 600mm <sup>2</sup> | 4 x1 or 1x4 Gen 2 | 33MHz<br>3 Slots | 6x 6Gb/s RAID 0,1,10 | Yes with RAID 0,1,10 | 4 v3.0<br>10 v 2.0<br>2 v1.1 | Up to 4-channels | Yes           | 32        | Yes             | Yes           | 7.8W                   |

# AMD Embedded Solutions, cont.

## Socket AM3/AM2<sup>1</sup>

| Model                     | OPN            | Number of Cores | Core Frequency          | Cache                 | Thermal Design Power <sup>3</sup> | Memory Interface                  | HyperTransport™ Interface          | Package | Product Release |
|---------------------------|----------------|-----------------|-------------------------|-----------------------|-----------------------------------|-----------------------------------|------------------------------------|---------|-----------------|
| AMD Phenom™ II XLT Q54L   | HEQ54LOEK4DGME | 4               | 2.2/0.8GHz <sup>2</sup> | L2 512K x4;<br>L3 6MB | 65/36.5W <sup>2</sup>             | DDR3-1333, 2-ch<br>Unbuffered ECC | One 16-lane@1.8GHz<br>Full Duplex  | AM3     | Q2-10           |
| AMD Athlon™ II XL - V66C  | AEV66CHDK23GME | 2               | 2.8GHz                  | 1MB x2                | 45W                               | DDR3-1066, 2-ch<br>Unbuffered ECC | One 16-lane@2GHz<br>Full Duplex    | AM3     | Q2-10           |
| AMD Athlon™ II XLT - V64L | AEV64LHFK23GME | 2               | 2.7GHz                  | 1MB x2                | 45W                               | DDR3-1066, 2-ch<br>Unbuffered ECC | One 16-lane@2GHz<br>Full Duplex    | AM3     | Q2-10           |
| AMD Athlon™ II XLT - V50L | AEV50LSFK23GME | 2               | 2.2/0.8GHz <sup>2</sup> | 1MB x2                | 25/13.8W <sup>2</sup>             | DDR3-1066, 2-ch<br>Unbuffered ECC | One 16-lane@2GHz<br>Full Duplex    | AM3     | Q2-10           |
| AMD Athlon™ X2 4200+      | ADD4200IAA5DOE | 2               | 2.2GHz                  | 512KB x2              | 35W                               | DDR2-800, 2-ch<br>nbuffered ECC   | One 16-lane@1000MHz<br>Full Duplex | AM2     | Q2-08           |
| AMD Athlon™ X2 3600+      | ADD3600IAA5DOE | 2               | 1.9GHz                  | 512KB x2              | 35W                               | DDR2-800, 2-ch<br>Unbuffered ECC  | One 16-lane@1000MHz<br>Full Duplex | AM2     | Q2-08           |
| AMD Athlon™ X2 3400e      | ADJ3400IAA5DOE | 2               | 1.8/1.0GHz <sup>2</sup> | 512KB x2              | 22/10.8W <sup>2</sup>             | DDR2-800, 2-ch<br>Unbuffered ECC  | One 16-lane@1000MHz<br>Full Duplex | AM2     | Q2-08           |
| AMD Athlon™ X2 3400+      | ADD3400IAA5CUE | 2               | 1.8GHz                  | 512KB x2              | 35W                               | DDR2-800, 2-ch<br>Unbuffered ECC  | One 16-lane@1000MHz<br>Full Duplex | AM2     | Q2-08           |
| AMD Athlon™ 3100+         | ADS3100IAR4DRE | 1               | 2.0GHz                  | 512KB                 | 25W                               | DDR2-667, 2-ch<br>Unbuffered ECC  | One 16-lane@1000MHz<br>Full Duplex | AM2     | Q4-07           |
| AMD Athlon™ 3000+         | ADD3000IAA4CNE | 1               | 1.8GHz                  | 512KB                 | 35W                               | DDR2-667, 2-ch<br>Unbuffered ECC  | One 16-lane@1000MHz<br>Full Duplex | AM2     | Q4-07           |
| AMD Athlon™ 2600+         | ADG2600IAV4DRE | 1               | 1.6GHz                  | 512KB                 | 15W                               | DDR2-667, 2-ch<br>Unbuffered ECC  | One 16-lane@800MHz<br>Full Duplex  | AM2     | Q4-07           |
| AMD Athlon™ 2000+         | ADF2000IAV4DRE | 1               | 1.0GHz                  | 512KB                 | 8W                                | DDR2-667, 2-ch<br>Unbuffered ECC  | One 16-lane@1000MHz<br>Full Duplex | AM2     | Q4-07           |

1. Socket AM3 processors can operate in Socket AM2 board designs with DDR2 memory. Socket AM2 processors cannot operate in Socket AM3 board designs with DDR3 memory.
2. While operating at the max/min P-States which can be dynamic or fixed through BIOS.
3. TDP specified in dual-plane platform.

## Socket S1

| Model                   | OPN            | Number of Cores | Core Frequency          | L2 Cache/Core | Thermal Design Power | Memory Interface             | HyperTransport™ Technology        | Tcase | Product Release |
|-------------------------|----------------|-----------------|-------------------------|---------------|----------------------|------------------------------|-----------------------------------|-------|-----------------|
| AMD Turion™ 64 X2 TL-62 | TMDTL62HAX5DME | 2               | 2.1GHz                  | 512KB x2      | 35W                  | DDR2-800, 2-ch<br>Unbuffered | One 16-lane@800MHz<br>Full Duplex | 95°C  | Q4-07           |
| AMD Turion™ 64 X2 TL-56 | TMDTL56HAX5DME | 2               | 1.8/0.8GHz <sup>1</sup> | 512KB x2      | 31/9.4W <sup>1</sup> | DDR2-800, 2-ch<br>Unbuffered | One 16-lane@800MHz<br>Full Duplex | 95°C  | Q4-07           |
| AMD Sempron™ 3700+      | SMS3700HAX4DQE | 1               | 2.0GHz                  | 512KB         | 25W                  | DDR2-800, 2-ch<br>Unbuffered | One 16-lane@800MHz<br>Full Duplex | 95°C  | Q4-07           |
| AMD Sempron™ 2100+      | SMF2100HAX3DQE | 1               | 1.0GHz                  | 256KB         | 8W                   | DDR2-800, 2-ch<br>Unbuffered | One 16-lane@800MHz<br>Full Duplex | 95°C  | Q4-07           |

1. While operating at the max/min P-States which can be dynamic or fixed through BIOS.

# AMD Embedded Solutions, cont.

## ASB2 BGA

| Model                     | OPN            | Number of Cores | Core Frequency          | L2 Cache/Core | Thermal Design Power | Memory Interface               | HyperTransport™ Technology     | Tdie | Product Release |
|---------------------------|----------------|-----------------|-------------------------|---------------|----------------------|--------------------------------|--------------------------------|------|-----------------|
| AMD Turion™ II Neo - N54H | TEN54HSDV23GME | 2               | 2.2GHz                  | 1MB x2        | 25W                  | DDR3-1333, 2-ch Unbuffered ECC | One 16-lane@1.6GHz Full Duplex | 95°C | Q4-10           |
| AMD Turion™ II Neo - N54L | TEN54LSDV23GME | 2               | 2.2GHz                  | 1MB x2        | 25W                  | DDR3-800, 2-ch Unbuffered ECC  | One 16-lane@1.6GHz Full Duplex | 95°C | Q2-10           |
| AMD Turion™ II Neo - N40H | TEN40HGA23GME  | 2               | 1.5GHz                  | 1MB x2        | 15W                  | DDR3-1333, 2-ch Unbuffered ECC | One 16-lane@1.6GHz Full Duplex | 95°C | Q4-10           |
| AMD Turion™ II Neo - N40L | TEN40LGA23GME  | 2               | 1.5GHz                  | 1MB x2        | 15W                  | DDR3-800, 2-ch Unbuffered ECC  | One 16-lane@1.6GHz Full Duplex | 95°C | Q2-10           |
| AMD Athlon™ II Neo - N36L | AEN36LLAV23GME | 2               | 1.3/0.8GHz <sup>1</sup> | 1MB x2        | 12/8W <sup>1</sup>   | DDR3-800, 2-ch Unbuffered ECC  | One 16-lane@1GHz Full Duplex   | 95°C | Q2-10           |
| AMD Athlon™ II Neo - R44L | AER44LLAV13GME | 1               | 1.7GHz                  | 1MB           | 12W                  | DDR3-800, 2-ch Unbuffered ECC  | One 16-lane@1GHz Full Duplex   | 95°C | Q2-10           |
| AMD Athlon™ II Neo - R34L | AER34LFCV13GME | 1               | 1.0GHz                  | 1MB           | 8W                   | DDR3-800, 2-ch Unbuffered ECC  | One 16-lane@1GHz Full Duplex   | 95°C | Q2-10           |

1. While operating at the max/min P-States which can be dynamic or fixed through BIOS.

## ASB1 BGA

| Model                   | OPN            | Number of Cores | Core Frequency          | L2 Cache/Core | Thermal Design Power  | Memory Interface              | HyperTransport™ Technology     | Tdie | Product Release |
|-------------------------|----------------|-----------------|-------------------------|---------------|-----------------------|-------------------------------|--------------------------------|------|-----------------|
| AMD Turion™ Neo X2 L625 | TMZL625OAX5DYE | 2               | 1.6/0.8GHz <sup>1</sup> | 512KB x2      | 18/10.1W <sup>1</sup> | DDR2-667, 2-ch Unbuffered ECC | One 16-lane@800MHz Full Duplex | 95°C | Q3-09           |
| AMD Athlon™ Neo X2 L325 | AMZL325OAX5DYE | 2               | 1.5GHz <sup>1</sup>     | 512KB x2      | 18W <sup>1</sup>      | DDR2-667, 2-ch Unbuffered ECC | One 16-lane@800MHz Full Duplex | 95°C | Q3-09           |
| AMD Sempron™ 210U       | SMG210UOAX3DVE | 1               | 1.5GHz                  | 256KB         | 15W                   | DDR2-400, Unbuffered          | One 16-lane@800MHz Full Duplex | 95°C | Q4-08           |
| AMD Sempron™ 208U       | SML208UOAX3DVE | 1               | 1.4GHz                  | 256KB         | 12W                   | DDR2-400, Unbuffered          | One 16-lane@800MHz Full Duplex | 95°C | Q4-08           |
| AMD Sempron™ 200U       | SMP200UOAX3DVE | 1               | 1.0GHz                  | 256KB         | 8W                    | DDR2-400, Unbuffered          | One 16-lane@800MHz Full Duplex | 95°C | Q4-08           |

1. While operating at the max/min P-States which can be dynamic or fixed through BIOS.

## AMD Embedded Discrete Graphics

| Model                                | Process | Package                             | TDP | # Shaders | Interface                       | Memory                        | Engine/ Memory Clock (MHz) | OS   | Compute                                    | Graphics  | Video  | Display Outputs  | Display Resolutions <sup>1</sup>   | Product Release |
|--------------------------------------|---------|-------------------------------------|-----|-----------|---------------------------------|-------------------------------|----------------------------|--|--|---|--|--|--|-----------------|
| ATI Radeon™ E2400 dGPU               | 65 nm   | GPU + memory<br>31x31 mm<br>BGA     | 13W | 40        | PCIe® 1.1 (x1, x2, x4, x8, x16) | 64-bit wide<br>128MB<br>GDDR3 | 600/700                    | Windows® XP/XPe/7, Windows Vista® Linux® (x86 32/64) | Single Precision FP Performance: 48 GFLOPs | DirectX® 10 Shader Model 3.0<br>OpenGL 3.3<br>3DMark™ 05 4061   | Unified Video Decoder (UVD) for H.264, VC-1<br>MPEG 1/2/4 decode & encode acceleration | Avivo™ Display System<br>Dual independent display controllers<br>2 active outputs from:<br>2x VGA<br>1x Comp/YC/YPbPr<br>2x single-link DVI<br>1x dual-link DVI<br>1x single / dual-link LVDS<br>1x HDMI™<br>1x DVO  | VGA: 400MHz pixel clk<br>Comp/YC: NTSC, PAL<br>YPbPr: 480i/p, 576i/p, 720p, 1080i  | Q1-08           |
| ATI Radeon™ E2400 MXM                |         | MXM 2.1a Type II module<br>73x78 mm | 18W |           |                                 | 64-bit wide<br>256MB<br>GDDR3 |                            |  |  | DirectX® 10 Shader Model 3.0<br>OpenGL 3.3  |  | Avivo™ Display System<br>Dual independent display controllers<br>Available on MXM 2.1a connector<br>2 active outputs from:<br>2x VGA<br>1x Comp/YC/YPbPr<br>2x single-link DVI<br>1x dual-link DVI<br>1x single / dual-link LVDS<br>1x HDMI™<br>1x DVO on header | Single-link DVI: 1600x1200 60Hz 24bpp<br>Dual-link DVI: 2048x1536 60Hz 24bpp<br>Single-link LVDS: 1280x1024 60Hz 24bpp<br>Dual-link LVDS: 2048x1536 60Hz 24bpp<br>HDMI™: 1920x1080i 60Hz 24bpp | Q2-08           |
| ATI Radeon™ E2400 PCIe® Add-in Board |         | PCIe® Add-in Board<br>16x11 cm      | 18W |           |                                 | 64-bit wide<br>128MB<br>GDDR3 |                            |  |  | Avivo™ Display System<br>Dual independent display controllers<br>Available on dual DVI-I connectors<br>2 active outputs from:<br>2x VGA<br>2x single-link DVI<br>1x dual-link DVI<br>1x HDMI™ |  | DVO: 220MHz pixel clk  | Q2-10  |                 |

# AMD Embedded Solutions, cont.

| AMD Embedded Discrete Graphics       |         |   |      |           |                                       |  |                                  |   |  |  |  |  |  |                    |
|--------------------------------------|---------|---|------|-----------|---------------------------------------|--|----------------------------------|---|--|--|--|--|--|--------------------|
| Model                                | Process | Package                                   | TDP  | # Shaders | Interface                             | Memory   | Engine/<br>Memory<br>Clock (MHz) | OS  | Compute  | Graphics   | Video  | Display<br>Outputs   | Display<br>Resolutions <sup>1</sup>  | Product<br>Release |
| ATI Radeon™ E4690 dGPU               | 55 nm   | GPU + memory<br>35x35 mm<br>BGA           | 25W  | 320       | PCIe® 2.0<br>(x1, x2, x4,<br>x8, x16) | 128-bit<br>wide<br>512MB<br>GDDR3              | 600/700                          | Windows®<br>XP/XPe/7,<br>Windows<br>Vista®<br>Linux®<br>(x86 32/64) | Single Precision<br>FP Performance:<br>384 GFLOPs  | DirectX® 10.1<br>Shader Model<br>4.0<br>OpenGL 3.3<br>3DMark™ 06<br>6886   | 2nd Generation<br>Unified Video<br>Decoder (UVD2)<br>for H.264, VC-1,<br>MPEG2 decode<br>SD & HD HQV™<br>processing<br>Blu-ray   | Avivo™ Display System<br>Dual independent display controllers<br>2 active outputs from:<br>2x VGA<br>1x Comp/YC/YPbPr<br>5x single-link DVI<br>3x dual-link DVI<br>1x single / dual-link LVDS<br>5x DisplayPort 1.1a<br>1x HDMI™<br>1x DVO         | VGA: 400MHz pixel clk<br>Comp/YC: NTSC, PAL<br>YPbPr: 480i/p, 576i/p, 720p,<br>1080i/p<br>Single-link DVI: 1600x1200<br>60Hz 24bpp                       | Q2-09              |
| ATI Radeon™ E4690 MXM                |         | MXM 3.0<br>Type A<br>Module<br>70x82 mm   | 32W  |           |                                       |  |                                  |   |  | Avivo™ Display System<br>Dual independent display controllers<br>Available on MXM 3.0 connector<br>2 active outputs from:<br>2x VGA<br>4x single-link DVI<br>2x dual-link DVI<br>1x single / dual-link LVDS<br>4x DisplayPort 1.1a<br>1x HDMI™                             |  | Dual-link DVI: 2048x1536<br>60Hz 24bpp<br>Single-link LVDS: 1280x1024<br>60Hz 24bpp<br>Dual-link LVDS: 2048x1536<br>60Hz 24bpp<br>DisplayPort 1.1a: 2560x1600<br>60Hz 24bpp  | Q1-10  |                    |
| ATI Radeon™ E4690 PCIe® Add-in Board |         | PCIe®<br>Add-in<br>Board<br>18x11 cm      | 34W  |           |                                       |  |                                  |   |  | Avivo™ Display System<br>Dual independent display controllers<br>Available on dual DVI-I connectors<br>2 active outputs from:<br>2x single / dual-link DVI<br>1x HDMI™<br>2x VGA   |  | HDMI™: 1920x1080p 60Hz<br>24bpp<br>DVO: 220MHz pixel clk   | Q1-10  |                    |
| Model                                | Process | Package                                   | TDP  | # Shaders | Interface                             | Memory   | Engine/<br>Memory<br>Clock (MHz) | OS  | Compute <sup>2</sup>   | Graphics <sup>3</sup>  | Video <sup>3</sup>   | Display<br>Outputs <sup>5,6</sup>  | Display<br>Resolutions <sup>1</sup>  | Product<br>Release |
| AMD Radeon™ E6460 dGPU               | 40nm    | GPU + memory<br>33x33mm<br>BGA            | ~20W | 160       | PCIe® 2.1<br>(x1, x2, x4,<br>x8, x16) | 64-bit<br>wide,<br>512MB<br>GDDR5,<br>25.6GB/s | 600 MHz/<br>3.2Gbps              | Windows™7<br>Windows™ 7<br>Embedded<br>Linux® (x86<br>32/64)        | AMD Accelerated<br>Parallel<br>Processing<br>(APP)<br>OpenCL™ 1.1<br>DirectCompute 11<br>Single Precision<br>FP Performance:<br>192 GFLOPs | DirectX® 11<br>Shader Model<br>5.0<br>OpenGL 4.1<br>AMD HD3D<br>Stereo 3D for<br>gaming<br>3DMark™<br>Vantage (P)<br>2195<br>AMD<br>CrossFireX™<br>multi-GPU<br>technology   | AMD Accelerated<br>Parallel<br>Processing<br>(APP)<br>SD & HD HQV™<br>processing<br>Dual HD decode<br>(up to 40 Mbps per<br>stream)<br>AMD HD3D<br>Blu-ray 3D<br>Integrated HD Audio<br>Decoder<br>7.1 channel<br>surround sound | ATI Eyefinity multi-display technology<br>Up to 2 display outputs from:<br>1x VGA,<br>4x Single / 1x Dual-Link DVI<br>1x Single / Dual-Link LVDS<br>1x HDMI™ 1.4a<br>2x DisplayPort 1.1a<br>3x DisplayPort 1.2<br>1x DVO                           | VGA: 400MHz pixel clk<br>Single-link DVI: 1600x1200<br>60Hz 24bpp<br>Dual-link DVI: 2048x1536<br>60Hz 24bpp  | Q3-11              |
| AMD Radeon™ E6460 MXM                |         | MXM 3.0<br>Type A<br>Module<br>70x82mm    | TBD  |           |                                       |  |                                  |   |  | ATI Eyefinity multi-display technology<br>Subject to limitations on MXM 3.0<br>connector<br>Up to 2 display outputs from:<br>1x VGA,<br>4x Single / 1x Dual-Link DVI<br>1x Single / Dual-Link LVDS<br>1x HDMI™ 1.4a<br>2x DisplayPort 1.1a<br>3x DisplayPort 1.2           |  | Single-link LVDS: 1280x1024<br>60Hz 24bpp<br>Dual-link LVDS: 2048x1536<br>60Hz 24bpp<br>DisplayPort 1.2: 2560x2048<br>60Hz 30bpp<br>DisplayPort 1.1a: 2560x1600<br>60Hz 24bpp<br>HDMI™ 1.4: 1920x1080p<br>60Hz 30bpp<br>DVO: 220MHz pixel clk      | Q4-11  |                    |
| AMD Radeon™ E6460 PCIe® Add-in Board |         | PCIe®<br>Add-in<br>Board<br>TBDx<br>TBDcm | TBD  |           |                                       |  |                                  |   |  | AMD Eyefinity multi-display technology<br>Two board variations with:<br>(1) 1x single-link DVI<br>1x dual-link DVI-I<br>1x DisplayPort 1.2<br>(2) 4x DisplayPort 1.2   |  |  | Q4-11  |                    |
| Model                                | Process | Package                                   | TDP  | # Shaders | Interface                             | Memory   | Engine/<br>Memory<br>Clock (MHz) | OS  | Compute <sup>2</sup>   | Graphics <sup>3</sup>  | Video <sup>3</sup>   | Display<br>Outputs <sup>5,6</sup>  | Display<br>Resolutions <sup>1</sup>  | Product<br>Release |
| AMD Radeon™ E6760 dGPU               | 40nm    | GPU + memory<br>37.5x37.5<br>mm BGA       | 35W  | 480       | PCIe® 2.1<br>(x1, x2, x4,<br>x8, x16) | 128-bit<br>wide<br>1GB<br>GDDR5<br>51.2GB/s    | 600 MHz/<br>3.2G bps             | Windows™7/<br>Windows™ 7<br>Embedded<br>Linux®<br>(x86 32/64)       | AMD Accelerated<br>Parallel<br>Processing<br>(APP)<br>OpenCL™ 1.1<br>DirectCompute 11<br>Single Precision<br>FP Performance:<br>576 GFLOPs | DirectX® 11<br>Shader Model<br>5.0<br>OpenGL 4.1<br>AMD HD3D<br>Stereo 3D for<br>gaming<br>3DMark™<br>Vantage (P)<br>5870<br>AMD<br>CrossFireX™<br>multi-GPU<br>technology   | AMD Accelerated<br>Parallel<br>Processing<br>(APP)<br>SD & HD HQV™<br>processing<br>Dual HD decode<br>(up to 40 Mbps per<br>stream)<br>AMD HD3D<br>Blu-ray 3D<br>Integrated HD Audio<br>Decoder<br>7.1 channel<br>surround sound | AMD Eyefinity multi-display technology<br>Up to 2 outputs from:<br>1x VGA<br>4x single-link DVI<br>1x dual-link DVI<br>1x single / dual-link LVDS<br>1x HDMI™ 1.4a<br>1x DVO<br>Up to 4 outputs from:<br>4x DisplayPort 1.2<br>2x DisplayPort 1.1a | VGA: 400MHz pixel clk<br>Single-link DVI: 1600x1200<br>60Hz 24bpp<br>Dual-link DVI: 2048x1536<br>60Hz 24bpp<br>Single-link LVDS: 1280x1024<br>60Hz 24bpp | Q2-11              |
| AMD Radeon™ E6760 MXM                |         | MXM 3.0<br>Type A<br>Module<br>70x82 mm   | TBD  |           |                                       |  |                                  |   |  | AMD Eyefinity multi-display technology<br>Available on MXM 3.0 connector<br>Up to 2 outputs from:<br>1x VGA<br>4x single-link DVI<br>1x dual-link DVI<br>1x single / dual-link LVDS<br>1x HDMI™ 1.4a<br>Up to 4 outputs from:<br>4x DisplayPort 1.2<br>2x DisplayPort 1.1a |  | Dual-link LVDS: 2048x1536<br>60Hz 24bpp<br>DisplayPort 1.2: 2560x2048<br>60Hz 30bpp<br>DisplayPort 1.1a: 2560x1600<br>60Hz 24bpp<br>HDMI™ 1.4a: 1920x1080p<br>60Hz 30bpp<br>DVO: 220MHz pixel clk  | Q3-11  |                    |
| AMD Radeon™ E6760 PCIe® Add-in Board |         | PCIe®<br>Add-in<br>Board<br>TBDxTBD<br>cm | TBD  |           |                                       |  |                                  |   |  | AMD Eyefinity multi-display technology<br>Two board variations with:<br>(1) 1x single-link DVI<br>1x dual-link DVI-I<br>1x DisplayPort 1.2<br>(2) 6x DisplayPort 1.2   |  |  | Q3-11  |                    |

# AMD Embedded Solutions, cont.

| AMD Embedded Discrete Graphics     |         |                                    |      |           |                                 |                                     |                                  |  |  |   |  |   |   |                    |
|------------------------------------|---------|------------------------------------|------|-----------|---------------------------------|-------------------------------------|----------------------------------|--|--|---|--|---|---|--------------------|
| Model                              | Process | Package                            | TDP  | # Shaders | Interface                       | Memory                              | Engine/<br>Memory<br>Clock (MHz) | OS   | Compute <sup>2</sup>   | Graphics <sup>3</sup>   | Video <sup>3</sup>   | Display<br>Outputs <sup>4,5</sup>   | Display<br>Resolutions <sup>1</sup>   | Product<br>Release |
| ATI Radeon™ HD 5770 Graphics Board |         | PC Add-in Board<br>23.5x11.2 cm    | 108W | 800       | PCIe® 2.1 (x1, x2, x4, x8, x16) | 128-bit wide 1GB GDDR5              | 850/4.8Gbps                      | Windows® XP/XPe/7, Windows Vista®<br>Linux® (x86_32)   | ATI Stream Technology<br>OpenCL™ 1.1 DirectCompute 11<br>Single Precision FP Performance: 1.36 TFLOPs                    | DirectX® 11 Shader Model 5.0<br>OpenGL 3.2<br>OpenCL™ 1.0<br>3DMark™ Vantage (P) 10141                    | 2nd Generation Unified Video Decoder (UVD2) for H.264, VC-1, MPEG4, MPEG2 decode<br>Dual HD 1080p decode<br>HQV Benchmark 2.0 score 175 <sup>2b</sup>  | ATI Eyefinity Avivo™ Display System<br>1x DisplayPort 1.1a + 2 displays from 2x dual-link DVI & 1x HDMI™ 1.3  | VGA: 2048x1536<br>Dual-link DVI: 2560x1600<br>DisplayPort 1.1a: 2560x1600<br>HDMI™ 1.3: 1920x1200p  | Q2-10              |
| AMD Radeon™ HD 6970M MXM           | 40nm    | MXM 3.0 Type B module<br>105x82 mm | 95W  | 960       | PCIe® 2.1 (x1, x2, x4, x8, x16) | 256-bit wide 2GB GDDR5<br>115.2GB/s | 680MHz / 3.6Gbps                 | Windows® 7 / Windows® 7 Embedded<br>Linux® (x86_32/64) | AMD Accelerated Parallel Processing (APP)<br>OpenCL™ 1.1 DirectCompute 11<br>Single Precision FP Performance: 1.3 TFLOPs | DirectX® 11 Shader Model 5.0<br>OpenGL 4.1<br>AMD HD3D Stereo 3D for gaming<br>3DMark™ Vantage (P) 10,059 | AMD Accelerated Parallel Processing (APP)<br>3rd Generation Unified Video Decoder (UVD3)<br>SD & HD HQV™ processing<br>Dual HD decode (up to 40 Mfps per stream)<br>AMD HD3D Blu-ray 3D<br>Integrated HD Audio Decoder, 7.1 channel surround sound | AMD Eyefinity multi-display technology<br>Subject to limitations on MXM 3.0 connector<br>Up to 2 outputs from:<br>1x VGA<br>4x single-link DVI<br>1x dual-link DVI<br>1x single / dual-link LVDS<br>1x HDMI™ 1.4a<br>Up to 4 outputs from:<br>4x DisplayPort 1.2<br>2x DisplayPort 1.1a | VGA: 400MHz pixel clk<br>Single-link DVI: 1600x1200 60Hz 24bpp<br>Dual-link DVI: 2048x1536 60Hz 24bpp<br>Single-link LVDS: 1280x1024 60Hz 24bpp<br>Dual-link LVDS: 2048x1536 60Hz 24bpp<br>DisplayPort 1.2: 2560x2048 60Hz 30bpp<br>DisplayPort 1.1a: 2560x1600 60Hz 24bpp<br>HDMI™ 1.4a: 1920x1080p 60Hz 30bpp | Q2-11              |

- Display resolutions limited by available memory bandwidth. Other resolutions available that do not oversubscribe link bandwidth.
- AMD APP technology is designed to improve video quality and enhance application performance. Full enablement of some features requires support for OpenCL™ or DirectCompute (including AMD's Universal Video Decoder (UVD)). Not all products have all features and full enablement of some capabilities and may require complementary products.
- AMD HD3D is a technology designed to enable stereoscopic support for 3D graphics and video. Additional hardware (e.g., 3D-enabled panels, 3D-enabled glasses/emitter, Blu-ray 3D drive) and/or software (e.g., Blu-ray 3D discs, 3D middleware, games) are required for the enablement of stereoscopic 3D.
- AMD Eyefinity technology can support multiple displays limited by display output clock dependencies. Microsoft® Windows® 7, Windows Vista®, or Linux® is required in order to support more than two displays. SLS ("Single Large Surface") functionality requires an identical display resolution on all configured displays.
- Subject to limitations on display output clocks. Two internal display PLLs + an integrated DisplayPort reference clock can support: (1) any two legacy displays + up to two DisplayPorts, or (2) One legacy display + up to three DisplayPorts, or (3) four DisplayPorts.
- Subject to limitations on display output clocks. Two internal display PLLs + an integrated DisplayPort reference clock can support: (1) any two legacy displays + up to four DisplayPorts, or (2) One legacy display + up to five DisplayPorts, or (3) six DisplayPorts.

| AMD Embedded Chipsets      |                |   |                                      |  |      |                                   |                 |                        |              |                     |     |   |  |         |  |                  |                 |                     |               |           |                                  |
|----------------------------|----------------|---|--------------------------------------|--|------|-----------------------------------|-----------------|------------------------|--------------|---------------------|-----|---|--|---------|--|------------------|-----------------|---------------------|---------------|-----------|----------------------------------|
| Model                      | Devices        | CPU Interface   | Package                              | PCI Express®   | PCI  | Graphics                          | AMD CrossFireX™ | DVI/HDMI™              | Display Port | LVDS                | TV  | DVO   | SATA 2.x   | IDE     | Power  | Ethernet MAC     | USB             | Audio               | LPC SPI SMBus | Max GPIOs | Display: Max Resol. <sup>1</sup> |
| AMD M690T                  | M690T/ SB600   | 1.0GHz HyperTransport™  | 21mm FCBGA/ 23mm FCBGA               | 1x8, 4x1 Gen 1   | v2.3 | DirectX® 9.0 WMV9                 | No              | 1 @ 1080P <sup>2</sup> | No           | 24-bit Dual-Channel | Yes | DVI & LVDS Transmitter Support <sup>3</sup> | 4, RAID 0, 1, 10 meets 1.0a spec                       | ATA 133 | 8W   | No               | 10 v2.0         | HD Audio, AC97 v2.3 | Yes           | 73        | 2048x1536                        |
| AMD M690E                  | M690E/ SB600   | 1.0GHz HyperTransport™  | 21mm FCBGA/ 23mm FCBGA               | 1x8, 4x1 Gen 1   | v2.3 | DirectX® 9.0 WMV9                 | No              | 2 @ 1080P <sup>2</sup> | No           | 24-bit Dual-Channel | No  | DVI & LVDS Transmitter Support <sup>3</sup> | 4, RAID 0, 1, 10 meets 1.0a spec                       | ATA 133 | 8W   | No               | 10 v2.0         | HD Audio, AC97 v2.3 | Yes           | 73        | 2048x1536                        |
| AMD 780E                   | 780E/ SB710    | 2.6GHz HyperTransport™ 3.0                                    | 21mm FCBGA/ 23mm FCBGA               | 2x8 or 1x16, 6x1 Gen 2   | v2.3 | DirectX® 10.0 OpenGL 2.0, UVD 2.0 | Yes             | 2 @ 1080P <sup>2</sup> | Yes          | 24-bit Dual-Channel | No  | No  | 6, RAID 0, 1, 10 meets 2.5 spec                        | ATA 133 | 13W  | No               | 12 v2.0, 2 v1.1 | HD Audio, AC97 v2.3 | Yes           | 73        | 2560x1600                        |
| AMD 785E                   | 785E/ SB8XX    | 2.6GHz HyperTransport™ 3.0                                    | 21mm FCBGA/ 23mm FCBGA               | 2x8 or 1x16, 6x1 Gen 2, 2x1 Gen 1  | v2.3 | DirectX® 10.1 OpenGL 2.0, UVD 2.0 | Yes             | 2 @ 1080P <sup>2</sup> | Yes          | 24-bit Dual-Channel | No  | No  | 6, RAID 0, 1, 5 <sup>4</sup> , 10 <sup>5</sup> , 6GBPS | No      | 6.4 - 13W                                      | Yes <sup>5</sup> | 14 v2.0, 2 v1.1 | HD Audio, AC97 v2.3 | Yes           | 73        | 2560x1600                        |
| AMD SR5690, SR5670, SR5650 | SR56x0/ SP5100 | HyperTransport™ 3.0 (5.2GT/s) Backward Compatible with HT 1.0 | 29x29mm FCBGA/ SP5100: 21x21mm FCBGA | Gen 2 v1.0; SR5690: 42 lanes/ 11 engines SR5670: 30 lanes/ 9 engines SR5650: 22 lanes/ 8 engines | v2.3 | N/A                               | N/A             | N/A                    | N/A          | N/A                 | N/A | N/A   | 6, RAID 0, 1, 10 meets 2.5 spec                        | ATA 133 | SR5690: 18W SR5670: 17W SR5650: 13W SP5100: 4W | No               | 12 v2.0, 2 v1.1 | HD Audio, AC97 v2.3 | Yes           | 73        | N/A                              |

- Capable display resolutions are influenced by the operating system driver, processor and memory selection.
- The PCI Express® x8 interface is multiplexed with a TMDs interface, enabling DVI or HDMI™ 1.2 with HDCP 1.1 support.
- The sideport memory interface of the M690T and M690E can be configured as a DVO to attach to an additional DVI, LVDS, or CRT transmitter.
- The LVDS interface of the M690E and 780E is multiplexed with a TMDs interface, enabling DVI or HDMI™ 1.2 (for the M690E) or HDMI™ 1.3b (for the 780E) with HDCP 1.1 support. This enables support for native dual DVI; however, only one HDMI™ interface may be enabled at a time.
- Available on the SB850.

| AMD Geode™ Solutions Based Reference Design Kits |  |                  |                      |                    |                 |            |        |                    |     |           |                      |                    |                   |             |                     |          |              |                     |               |     |   |   |  |
|--|--|------------------|----------------------|--------------------|-----------------|------------|--------|--------------------|-----|-----------|----------------------|--------------------|-------------------|-------------|---------------------|----------|--------------|---------------------|---------------|-----|---|---|--|
| Name   | Processor  | Companion Device | Form Factor (Inches) | Video Output       | OS <sup>1</sup> |            |        | I/O Connectors     |     |           |                      |                    |                   |             |                     |          |              |                     |               |     |   |   |  |
|  |  |                  |                      |                    | Windows® XP/XPe | Windows CE | Linux® | Audio Out Channels | USB | PCI Slots | LPC Slots or Headers | Super I/O on Board | Ethernet on Board | Power Input | Serial ATA          | IDE UDMA | Serial Ports | PS/2 Keyboard/Mouse | Parallel Port | IDE |   |   |  |
| LX ETX   | AMD Geode™ LX 800@0.9W <sup>2</sup>                | AMD CS5536       | 3.7x4.5              | CRT/TFT            | •               | •          | •      | 4                  | 4   |           |                      |                    |                   | 1           | SVDC thru ETX conn. |          |              |                     |               |     |   |   |  |
| LX Ultra Value Client                            | AMD Geode™ LX 800@0.9W <sup>2</sup>                | AMD CS5536       | 5.5x5                | CRT                | •               | •          | •      | 1                  | 4   | 1         |                      |                    |                   | 1           | 12VDC               |          |              |                     |               |     |   |   |  |
| LX EPIC Single Board Computer                    | AMD Geode™ LX 800@0.9W or LX 700@0.8W <sup>2</sup> | AMD CS5536       | 4.5x6.5              | CRT/TFT/LVDS       | •               | •          | •      | 2                  | 4   | Mini PCI  |                      |                    |                   | •           | 1                   | Mini-ITX |              |                     | •             | 2   | • | • |  |
| LX Network Attached Storage Processor            | AMD Geode™ LX 800@0.9W or LX 700@0.8W <sup>2</sup> | AMD CS5536       | Mini-ITX             | CRT for debug only | •               | •          | •      | 3                  |     |           |                      |                    |                   |             | 1                   | ATX      |              | 1                   | •             | 2   |   |   |  |

- OS support typically includes BIOS and drivers for audio, display, and bootloader if required.
- The Geode LX 800@0.9W processor operates at 500MHz and the Geode LX 700@0.8W processor operates at 433MHz. Model numbers reflect performance as described here: <http://www.amd.com/connectivitysolutions/geodebenchmark>

# AMD Embedded Solutions, cont.

## AMD Geode™ Processors

| Processor Family   | Device Number | Chipset    | Package/ Operating Case Temp.                     | Core Freq. (Perform. Rating) | Core Volt | Thermal Design Power | Power Mgmt./ Rating | FPU                      | Memory Support | PCI  | Ethernet | IDE             | USB           | LPC    | Audio     | UART/ IR | Serial/ Parallel Interfaces | RTC | Max. GPIOs | Security                                | Display: Max Res.                                      |
|--|---------------|------------|---|------------------------------|-----------|----------------------|---------------------|--------------------------|----------------|------|----------|-----------------|---------------|--------|-----------|----------|-----------------------------|-----|------------|---|--|
| AMD Geode™ LX Processors (Integrated North Bridge/ Graphics) | LX900@ 1.5W   | AMD CS5536 | BGU481 0°C to 80°C                                | 600MHz (900)                 | 1.4V      | 5.1W                 | ACPI v2.0           | MMX™, 3DNow!™ Technology | DDR-400        | v2.2 | No       | 1 Ch., UDMA-100 | 4 Ports, v2.0 | 1 LDRQ | AC97 v2.3 | 2/1      | ACCESS.bus w/2 Ports        | 1   | 32         | 28-Bit AES w/Optional In-package EEPROM | CRT: 1920x1440<br>TFT: 1600x1200<br>VIP/VOP = 1.1, 2.0 |
|  | LX800@ 0.9W   |            | BGU481 0°C to 85°C and -40°C to 85°C <sup>2</sup> | 500MHz (800)                 | 1.25V     | 3.6W                 |                     |                          | DDR-400        |      |          |                 |               |        |           |          |                             |     |            |   |  |
|  | LX700@ 0.8W   |            | BGU481 0°C to 85°C                                | 433MHz (700)                 | 1.2V      | 3.1W                 |                     |                          | DDR-333        |      |          |                 |               |        |           |          |                             |     |            |   |  |
|  | LX600@ 0.7W   |            | BGU481 0°C to 85°C                                | 366MHz (600)                 | 1.2V      | 2.8W                 |                     |                          | DDR-266        |      |          |                 |               |        |           |          |                             |     |            |   |  |

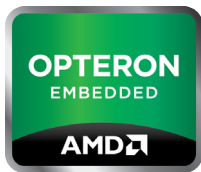
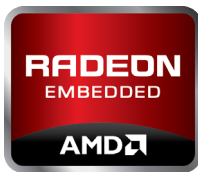
## AMD64 Reference Design Kits

| Name  | Processor Support  | Chipset                                 | Form Factor                               | Topology                                | OS                        |        | Display  | I/O Connectors                     |                                 |     |  |  |                                       |        | Electrical/Mechanical        |                                     |                |
|---|--|---|---|---|---------------------------|--------|--|------------------------------------|---------------------------------|-----|--|--|---------------------------------------|--------|------------------------------|-------------------------------------|----------------|
|   |  |   |   |   | Windows®                  | Linux® |  | Ethernet                           | Aux Slots                       | IDE | SAS/SATA   | Audio  | USB                                   | Serial | Standard                     | NEBS                                | Compliance     |
| FT1 Processor with A55E Controller Hub NAS                        | AMD Embedded G-Series APU                                      | A55E                                    | 170mm x 132mm (custom form factor)        | N/A                                     | Windows                   | •      | Headless   | 1Gb                                | 1x Mini-PCIe                    | No  | 6 Internal SATA 6Gb/s                              | No   | 2x USB 2.0 External 2x USB 2.0 Header | No     | Custom                       | N/A                                 | RoHS Compliant |
| AMD FT1 Processor with A50M Controller Hub xSTB                   | AMD Embedded G-Series APU                                      | A50M                                    | 170mm x 130mm (custom form factor)        | N/A                                     | Windows XP/e, Windows 7/e | •      | HDMI™  | 1Gb                                | 2x Mini-PCIe, 1x Half Mini-PCIe | No  | 2 Internal SATA 3Gb/s                              | 2 RCA L/R 1 RCA S/PDIF 1 Optical TOS-Link              | 2x USB 2.0 External 6x USB 2.0 Header | No     | Custom                       | N/A                                 | RoHS Compliant |
| AMD ASB1 Processor with 780E/SB710 Chipset xSTB                   | AMD Turion™ II Neo and AMD Athlon™ II Neo Processors           | SR5650, SP5100 and RS780E/SB710         | 4" (Width: 102mm) x 5.83" (Length: 148mm) | N/A                                     | Windows XP/e, Windows 7/e | •      | HDMI™, VGA   | 1Gb                                | 1x Mini-PCIe, 1 MXM 3.0b        | No  | 3 Internal SATA 3Gb/s                              | 1 Mini RCA L/R 1 RCA S/PDIF                            | 2x USB 2.0 External 6x USB 2.0 Header | No     | Custom                       | N/A                                 | RoHS Compliant |
| AMD ASB2 with SR5650/SP5100 Chipset SOHO/SMB RDK                  | AMD Turion™ II Neo and AMD Athlon™ II Neo Processors           | SR5650, SP5100                          | 4" (Width: 102mm) x 5.83" (Length: 148mm) | N/A                                     | Windows® Server 2008 R2   | •      | Headless   | 1Gb                                | Sage IDE Debug Header           | No  | 4 Internal SATA 3Gb/s; 1 External SATA 2.x 3Gbps   | No   | 4                                     | 4      | Custom                       | N/A                                 | RoHS Compliant |
| High Performance Embedded Graphics RDK                            | AMD Athlon™ II XL/XLT Processors AMD Phenom™ II XLT Processors | 780E, SB710, and ATI Radeon™ E4690 GPU  | 203mm x 122mm custom form factor          | N/A                                     | •                         | •      | 4 HDMI™ connectors, Supports CES-861B video modes, including 4800, 720p, 1980i and 1080p | 1Gb                                | None                            | No  | 2 Internal SATA 2.x, 3Gbps; 1 External eSATA 3Gb/s | 2 channel HDaudio: 1 analog line in, 1 analog line out | 2                                     | 2      | Custom                       | N/A                                 | RoHS Compliant |
| Second-Generation AMD Opteron™ Processor-based AdvancedTCA® Blade | AMD Opteron™ Model 2210 EE Processor                           | Broadcom HT-2100, HT-1000               | ATCA® Blade                               | Dual Star Backplane or 5 slot Full Mesh | •                         | •      |  | Dual 1G to Fabric, Dual 1G to Base | AMC® x2 Half Height             | No  | •  |  | 2                                     | 1      | Core Specification PICMG 3.0 | NEBS Level-3 and ETSI Installations | RoHS Compliant |
| AMD Socket S1 Processor COM Express                               | AMD Turion™ 64 X2, Mobile AMD Sempron™ Processors              | M690T/E with ATI Radeon™ X1250 Graphics | COM Express Type 2                        | N/A                                     | •                         | •      | DVI, LVDS, Analog VGA, TV  | 1Gb                                | 3x1 PCIe®, 1x8 PCIe, PCI        | 2Ch | •  | HD   | 8                                     |        | COM.0                        | N/A                                 | RoHS Compliant |
| AMD Sempron™ 210U/200U Processor Mini-DTX                         | ABS1 BGA Processors  | M690E with ATI Radeon™ X1250 Graphics   | Mini-DTX                                  | N/A                                     | •                         | •      | DVI VGA  | 1Gb                                | 2x1 PCIe                        | •   | •  | HD   | 6                                     |        | Mini-DTX                     | N/A                                 | RoHS Compliant |

# AMD Embedded Solutions, cont.

| AMD Development Boards                |  |                           |             |   |   |   |                 |                             |                            |                            |                    |                    |  | Typical Kit Contents  |                   |                       |           |          |                      |                            |                                  |                          |            |          |              |                     |               |      |                        |                           |  |
|---------------------------------------|--|---------------------------|-------------|---|---|---|-----------------|-----------------------------|----------------------------|----------------------------|--------------------|--------------------|--|---|-------------------|-----------------------|-----------|----------|----------------------|----------------------------|----------------------------------|--------------------------|------------|----------|--------------|---------------------|---------------|------|------------------------|---------------------------|--|
| Name                                  | Processor (* Denotes Processor shipped in Kit)   | Chipset                   | Form Factor | Display Output                                  | Windows <sup>®</sup> 7 / Windows <sup>®</sup> Embedded Standard 7 | Windows <sup>®</sup> Embedded Standard 2009 | OS <sup>1</sup> | Windows <sup>®</sup> XP/XPe | Windows <sup>®</sup> CE5.0 | Windows <sup>®</sup> CE6.0 | Linux <sup>®</sup> | Audio Out Channels | USB  |   | PCI Express Slots | PCI Express Mini Card | PCI Slots | Mini-PCI | LPC Slots or Headers | Super I/O on Board         | Ethernet on Board                | Power                    | Serial ATA | IDE/UDMA | Serial Ports | PS/2 Keyboard/Mouse | Parallel Port | IrDA | DVI/HDMI Adapter Board | CD-ROM/Std. Documentation |  |
| <b>AMD64 BASED DEVELOPMENT BOARDS</b> |  |                           |             |   |   |   |                 |                             |                            |                            |                    |                    |  |   |                   |                       |           |          |                      |                            |                                  |                          |            |          |              |                     |               |      |                        |                           |  |
| AMD DB-FS1r2                          | AMD R-Series APU<br>R-464L *<br>R-460H<br>R-272F<br>R-268D   | A75                       | microATX    | 1. 2x Dual-mode Display Port (DP++)<br>- 1x VGA | •   | •   | •               | •                           | •                          | •                          | •                  | 2                  | 1. 2x USB 3.0<br>- 4x USB 2.0 connector<br>- 2x USB 2.0 header (4 ports) | 1. 1x X16 (PCIe Gen2)<br>- 1x X1 (PCI Gen2)                 | 2                 | 2                     | •         | 1        | 1x RJ45 1GbE         | 24-pin ATX + 4-pin ATX 12V | 1. 1x eSATA<br>- 5x SATA (6Gb/s) | •                        | •          | •        | •            | •                   | IR receiver   | •    | •                      |                           |  |
| AMD DB-FT1                            | G-Series T56N (DBFT1-00-E1-EVAL-KT)<br>G-Series T40N (DBFT1-01-E1-EVAL-KT)<br>G-Series T40E (DBFT1-02-EVAL-KT) | A55E                      | Mini-ITX    | VGA, single-link DVI-D support, LVDS            | •   | •   | •               | •                           | •                          | •                          | •                  | 2                  | 8x USB 2.0   | 1 x1 (requires riser card)                                  | •                 | 1                     | •         | •        | 1                    | 1x RJ45 1GbE               | ATX                              | 4x, (3Gbp/s)             | •          | 4        | •            | •                   | •             | •    | •                      |                           |  |
| S1 DBM690T/E                          | Mobile AMD Sempron™ 3500+* and 2100+, AMD Turion™ 64 X2 TL-52, AMD Sempron™ 2100+                              | AMD M690T or M690E, SB600 | ATX         | CRT, DVI, HDMI, LVDS                            | •   | •   | •               | •                           | •                          | •                          | •                  | 7.1                | 9x USB 2.0   | 1x16 <sup>2</sup> 1x1                                       | 1x                | 3                     | 1         | 1        | 1                    | 1x RJ45 1GbE               | ATX                              | 4x, (3Gbp/s)             | •          | 1        | 1            | 1                   | •             | •    | •                      |                           |  |
| AM2+ DB780E                           | AMD Athlon™ X2 4200+ and 3400e, AMD Athlon™ 3100+ and 2000+, AMD Athlon™ II XLT, AMD Phenom™ II XLT            | AMD 780E, SB710           | ATX         | CRT, DVI  | •   | •   | •               | •                           | •                          | •                          | •                  | 7.1                | 12x USB 2.0  | 2x X16 (x16 connector with a x8 electrical interface) 1x X4 | •                 | 1                     | •         | •        | 1                    | 1x RJ45 1GbE               | ATX                              | 1x eSATA 5x SATA (3Gb/s) | •          | 2        | •            | •                   | •             | •    | •                      |                           |  |

1. OS support typically includes BIOS and drivers for audio, display, and bootloader if required.  
2. The S1 DBM690T/E has one x16 PCI Express slot that is supported by a 1x8 PCI Express interface.



[www.amd.com/embedded](http://www.amd.com/embedded)

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