

AMD Embedded Solutions

Product Selection Guide



AMD combines x86 processing and graphics domain expertise to deliver innovation breakthroughs that help empower next-generation solutions

AMD helps deliver the right balance of CPU, GPU and chipset capabilities, optimized for workloads and applications users care about most. Along with a broad range of varied solutions, AMD supports the x86 embedded marketplace with design tools, support, and technology partnerships that offer simplicity and flexibility to help create high-performance, feature-rich, and customer-driven products.

AMD is an innovation leader in 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, 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:

- Industry-leading performance-per-watt
- Highest available I/O throughput with HyperTransport™ technology
- Integrated memory controller offers low latency and reduced chip count, helping improve reliability
- Native quad-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.

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. Ranging from high-performance single-, dual- and quad-core AMD Opteron™ processors and single- and dual-core AMD Athlon™ processor with Direct Connect Architecture for enterprise-class storage and networking equipment to highly versatile and efficient Mobile

AMD Sempron™ processors and dual-core AMD Turion™ 64 X2 mobile technology for unique high-performance, smaller form factor applications to the ASB1 (BGA) family of processors that are designed with unique computing features and a thin, compact form factor to help enable new and uncompromising designs. ASB1 processors are packaged in a small footprint, lidless 812-ball BGA (Ball Grid Array) package. The AMD64 processor family provides high performance, 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 patent pending 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 ASint 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 ATI Radeon™ embedded graphics family: game-changing graphics for embedded systems

ATI Radeon™ embedded graphics are designed to deliver desktop-level visual experiences to embedded systems. The hardware video decoder offloads the CPU for H.264 and VC-1 high-definition video playback¹. The 3D graphics engine supports Microsoft® DirectX® and OpenGL graphics APIs for easy programming of the latest visual effects. A variety of performance levels are available, ranging from industry leading integrated graphics offered in AMD embedded chipsets to superior performance using discrete graphics chips to achieve leading-edge frame rates with maximum content.

Tools and support for developers

AMD offers:

- A full range of RDK products designed to enable designers to go from concept to finished product quickly
- A broad array of DBs 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? Experience the AMD advantage.

Note 1 HD monitor required for HD playback.



AMD Embedded Solutions

Product Selection Guide

AMD EMBEDDED PROCESSORS

Quad-Core AMD Opteron™ Processors

Model	OPN	AMD64	Multi-CPU Scalability	Core Frequency	Cache	Peak Power (worst case) TDP	Memory Interface	HyperTransport™ Technology	AMD Digital Media Xpress™ Technology	AMD PowerNow!™ Technology	AMD-V™ Technology
83VS	OE83VSWHP4DGIE	Yes	Up to 16	2.8GHz	L2: 512KB x4	115W	Dual 64/72 DDR2-800 Registered DIMMs, EEC & Chip Kill	Three 16-lane@2.2GHz Full Duplex	Yes	Yes	Yes
83QS HE	OE83QSMAP4DGIE	Yes	Up to 16	2.4GHz	L3: 6MB	71W	Dual 64/72 DDR2-800 Registered DIMMs, EEC & Chip Kill	Three 16-lane@2.0GHz Full Duplex	Yes	Yes	Yes
23VS	OE23VSWHP4DGIE	Yes	Up to 16	2.8GHz		115W	Dual 64/72 DDR2-800 Registered DIMMs, EEC & Chip Kill	Three 16-lane@2.2GHz Full Duplex	Yes	Yes	Yes
23QS HE	OE23QSMAP4DGIE	Yes	Up to 16	2.4GHz		71W	Dual 64/72 DDR2-800 Registered DIMMs, EEC & Chip Kill	Three 16-lane@2.0GHz Full Duplex	Yes	Yes	Yes
23KS EE	OE23KSFLP4DGIE	Yes	Up to 16	2.0GHz		50W	Dual 64/72 DDR2-800 Registered DIMMs, EEC & Chip Kill	Three 16-lane@1.8GHz Full Duplex	Yes	Yes	Yes
13QS HE	OEI3QSMAP4DGIE	Yes	Up to 16	2.4GHz		71W	Dual 64/72 DDR2-800 Registered DIMMs, EEC & Chip Kill	Three 16-lane@2.0GHz Full Duplex	Yes	Yes	Yes
13KS EE	OEI3KSFLP4DGIE	Yes	Up to 16	2.0GHz		50W	Dual 64/72 DDR2-800 Registered DIMMs, EEC & Chip Kill	Three 16-lane@1.8GHz Full Duplex	Yes	Yes	Yes

Dual-Core AMD Opteron™ Processors

Model	OPN	AMD64	Multi-CPU Scalability	Core Frequency	L2 Cache/ Core	Thermal Design Power	Memory Interface	HyperTransport™ Technology	AMD Digital Media Xpress™ Technology	AMD PowerNow!™ Technology	AMD-V™ Technology	EVP ¹	Tease	Socket	Package
8214 HE	OSP8214GAU6CYE	Yes	up to 8	2.2GHz	1MB x2	68W	Dual 64/72 DDR2-667 Registered DIMMs, EEC & Chip Kill	Three 16-lane@1GHz Full Duplex	Yes	Yes	Yes	Yes	83°C	F (1207)	Lidded 1207 pad LGA
8210 EE	OSH8210GAS6CYE	Yes	up to 8	1.8GHz	1MB x2	45W	Dual 64/72 DDR2-667 Registered DIMMs, EEC & Chip Kill	Three 16-lane@1GHz Full Duplex	Yes	Yes	Yes	Yes	80°C	F (1207)	Lidded 1207 pad LGA
2214 HE	OSP2214GAU6CXE	Yes	up to 2	2.2GHz	1MB x2	68W	Dual 64/72 DDR2-667 Registered DIMMs, EEC & Chip Kill	Three 16-lane@1GHz Full Duplex	Yes	Yes	Yes	Yes	83°C	F (1207)	Lidded 1207 pad LGA
2210 EE	OSH2210GAS6CXE	Yes	up to 2	1.8GHz	1MB x2	45W	Dual 64/72 DDR2-667 Registered DIMMs, EEC & Chip Kill	Three 16-lane@1GHz Full Duplex	Yes	Yes	Yes	Yes	80°C	F (1207)	Lidded 1207 pad LGA
2208 HE	OSP2208GAA5CXE	Yes	up to 2	1.8GHz	512KB x2	68W	Dual 64/72 DDR2-667 Registered DIMMs, EEC & Chip Kill	Three 16-lane@1GHz Full Duplex	Yes	Yes	Yes	Yes	76°C	F (1207)	Lidded 1207 pad LGA
1214 HE	OSP1214GAU6DGE	Yes	1	2.2GHz	1MB x2	68W	Dual 64/72 DDR2-667 Registered DIMMs, EEC & Chip Kill	Three 16-lane@1GHz Full Duplex	Yes	Yes	Yes	Yes	83°C	F (1207)	Lidded 1207 pad LGA
1210 EE	OSH1210GAS6DGE	Yes	1	1.8GHz	1MB x2	45W	Dual 64/72 DDR2-667 Registered DIMMs, EEC & Chip Kill	Three 16-lane@1GHz Full Duplex	Yes	Yes	Yes	Yes	80°C	F (1207)	Lidded 1207 pad LGA

AMD Opteron™ Processors

Model	OPN	AMD64	Multi-CPU Scalability	Core Frequency	L2 Cache/ Core	Thermal Design Power	Memory Interface	HyperTransport™ Technology	AMD Digital Media Xpress™ Technology	AMD PowerNow!™ Technology	AMD-V™ Technology	EVP ¹	Tease	Socket	Package
2204 EE	OSH2204GAA4DTE	Yes	up to 2	1.8GHz	512KB	45W	Dual 64/72 DDR2-667 Registered DIMMs, EEC & Chip Kill	Three 16-lane@1GHz Full Duplex	Yes	Yes	Yes	Yes	76°C	F (1207)	Lidded 1207 pad LGA

Note 1. As part of a comprehensive security program, AMD strongly recommends enabling Enhanced Virus Protection (EVP) and using up to date third party anti-virus software.

For system and board level products utilizing AMD processors, please visit www.amd.com/embedded/catalog

AMD EMBEDDED PROCESSORS CONTINUED

AMD Turion™ 64 X2 Dual-Core Mobile Technology

Model	OPN	AMD64	Number of Cores	Core Frequency	L2 Cache/ Core	Thermal Design Power	Memory Interface	HyperTransport™ Technology	AMD Digital Media Xpress™ Technology	AMD PowerNow!™ Technology	AMD-V™ Technology	EVP ¹	Tcase	Socket	Package
L625	TMZL625OAX5DYE	Yes	2	1.6/0.8GHz ²	512KB x2	18/10.1W ²	Dual 64 ECC DDR2-667, Unbuffered	One 16-lane@800MHz Full Duplex	Yes	Yes	Yes	Yes	95°C	ASBI	Lidless 812-BGA
TL-62	TMDTL62HAX5DME	Yes	2	2.1GHz	512KB x2	35W	Dual 64 Non-ECC DDR2-800, Unbuffered	One 16-lane@800MHz Full Duplex	Yes	Yes	Yes	Yes	95°C	Sigl	Lidless 638-pin oµPGA
TL-56	TMDTL56HAX5DME	Yes	2	1.8/0.8GHz ²	512KB x2	31/9.4W ²	Dual 64 Non-ECC DDR2-800, Unbuffered	One 16-lane@800MHz Full Duplex	Yes	Yes	Yes	Yes	95°C	Sigl	Lidless 638-pin oµPGA

Note 1. As part of a comprehensive security program, AMD strongly recommends enabling Enhanced Virus Protection (EVP) and using up to date third party anti-virus software.

Note 2. While operating at the max/min P-States which can be dynamic or fixed through BIOS.

AMD Athlon™ X2 Dual-Core Processors

Model	OPN	AMD64	Number of Cores	Core Frequency	L2 Cache/ Core	Thermal Design Power	Memory Interface	HyperTransport™ Technology	AMD Digital Media Xpress™ Technology	AMD PowerNow!™ Technology	AMD-V™ Technology	EVP ¹	Tcase	Socket	Package
L325	AMZL325OAX5DYE	Yes	2	1.5GHz	512KB x2	18W	Dual 64 ECC DDR2-800, Unbuffered	One 16-lane@800MHz Full Duplex	Yes	No	Yes	Yes	95°C	ASBI	Lidless 812-BGA
4200+	ADD4200IAA5DOE	Yes	2	2.2GHz	512KB x2	35W	Dual 64 ECC DDR2-800, Unbuffered	One 16-lane@1000MHz Full Duplex	Yes	Yes	Yes	Yes	Var.	AM2	Lidded 940-pin oµPGA
3600+	ADD3600IAA5DOE	Yes	2	1.9GHz	512KB x2	35W	Dual 64 ECC DDR2-800, Unbuffered	One 16-lane@1000MHz Full Duplex	Yes	Yes	Yes	Yes	Var.	AM2	Lidded 940-pin oµPGA
3400e	ADJ3400IAA5DOE	Yes	2	1.8/1.0GHz ²	512KB x2	22/10.8W ²	Dual 64 ECC DDR2-800, Unbuffered	One 16-lane@1000MHz Full Duplex	Yes	Yes	Yes	Yes	Var.	AM2	Lidded 940-pin oµPGA

Note 1. As part of a comprehensive security program, AMD strongly recommends enabling Enhanced Virus Protection (EVP) and using up to date third party anti-virus software.

Note 2. While operating at the max/min P-States which can be dynamic or fixed through BIOS.

AMD Athlon™ Processors

Model	OPN	AMD64	Number of Cores	Core Frequency	L2 Cache/ Core	Thermal Design Power	Memory Interface	HyperTransport™ Technology	AMD Digital Media Xpress™ Technology	AMD PowerNow!™ Technology	AMD-V™ Technology	EVP ¹	Tcase	Socket	Package
3100+	ADS3100IAR4DRE	Yes	1	2.0GHz	512KB	25W	Dual 64 ECC DDR2-667, Unbuffered	One 16-lane@1000MHz Full Duplex	Yes	Yes	Yes	Yes	81°C	AM2	Lidded 940-pin oµPGA
3000+	ADD3000IAA4CNE	Yes	1	1.8GHz	512KB	35W	Dual 64 ECC DDR2-667, Unbuffered	One 16-lane@1000MHz Full Duplex	Yes	Yes	Yes	Yes	Var.	AM2	Lidded 940-pin oµPGA
2600+	ADG2600IAV4DRE	Yes	1	1.6GHz	512KB	15W	Dual 64 ECC DDR2-667, Unbuffered	One 16-lane@800MHz Full Duplex	Yes	Yes	Yes	Yes	85°C	AM2	Lidded 940-pin oµPGA
2000+	ADF2000IAV4DRE	Yes	1	1.0GHz	512KB	8W	Dual 64 ECC DDR2-667, Unbuffered	One 16-lane@1000MHz Full Duplex	Yes	No	Yes	Yes	85°C	AM2	Lidded 940-pin oµPGA

Note 1. As part of a comprehensive security program, AMD strongly recommends enabling Enhanced Virus Protection (EVP) and using up to date third party anti-virus software.

AMD Geode™ Processors

Processor Family	Device Number	Chipset	Package/ Operating Case Temp.	Core Freq. (Performance Rating)	Core Volt	Thermal Design Power	Power Management/ Rating	FPU	Memory Support	PCI	Ethernet	IDE	USB	LPC	Audio	UART/ IR	Serial/ Parallel Interfaces	RTC	Max. GPIOs	Security	Display: Max Resolution	
AMD Geode™ LX Processors (Integrated North Bridge/ Graphics)	AMD Geode™ LX900@1.5W	AMD CS5536	BGU481 0°C to 80°C	600MHz (900)	1.4V	5.1W	ACPI v2.0	MMX™, AMD 3DNow!™ Technology	DDR400 ³	v2.2	No	1 Ch., UDMA-100	4 Ports, v2.0	1 LDRO	AC97 v2.3	2/1	ACCESS. bus w/2 Ports	1	32	28-Bit AES w/ Optional In-package EEPROM	CRT: 1920x1440 TFT: 1600x1200 VIP/VOP = 11, 2.0	
	AMD Geode™ LX800@0.9W		BGU481 0°C to 85°C and -40°C to 85°C ²	500MHz (800)	1.25V	3.6W			DDR400 ³													
	AMD Geode™ LX700@0.8W		BGU481 0°C to 85°C	433MHz (700)	1.2V	3.1W			DDR333 ³													
	AMD Geode™ LX600@0.7W		BGU481 0°C to 85°C	366MHz (600)	1.2V	2.8W			DDR266 ³													28-Bit AES

Note 1. The Geode LX 900@1.5W processor operates at 600MHz, the Geode LX 800@0.9W processor operates at 500MHz, the Geode LX 700@0.8W processor operates at 433MHz, and the Geode LX600@0.7W processor operates at 366MHz.

Note 2. Model numbers reflect performance as described here: <http://www.amd.com/connectivitysolutions/geode/benchmark>.

Note 3. -40°C to 85°C is the optional Operating Case Temperature for the Geode LX800@0.9W and CS5536. The standard Operating Case Temperature is 0°C to 85°C. Be sure to request the extended temperature version if required.

Note 4. Support for DDR2 available. Please see application note "AMD Geode™ LX Processor-Based System with ASint SO-DIMM Module" order #46950, posted on the AMD Embedded Developer Support Web site (<http://www.amd.com/dev>).

AMD EMBEDDED PROCESSORS CONTINUED

AMD Sempron™ Processors

Model	OPN	AMD64	Number of Cores	Core Frequency	L2 Cache/ Core	Thermal Design Power	Memory Interface	HyperTransport™ Technology	AMD Digital Media Xpress™ Technology	AMD PowerNow™ Technology	AMD-V™ Technology	EVP ¹	Tcase	Socket	Package
3700+	SMS3700HAX4DOE	Yes	1	2.0GHz	512KB	25W	Dual 64 Non-ECC DDR2-667, Unbuffered	One 16-lane@800MHz Full Duplex	Yes	Yes	No	Yes	95°C	Sigl	Lidless 638-pin oµPGA
3500+	SMS3500HAX4CME	Yes	1	1.8GHz	512KB	25W	Dual 64 Non-ECC DDR2-667, Unbuffered	One 16-lane@800MHz Full Duplex	Yes	Yes	No	Yes	95°C	Sigl	Lidless 638-pin oµPGA
2100+	SMF2100HAX3DOE	Yes	1	1.0GHz	256KB	8W	Dual 64 Non-ECC DDR2-400, Unbuffered	One 16-lane@800MHz Full Duplex	Yes	No	No	Yes	95°C	Sigl	Lidless 638-pin oµPGA
210U	SMG210UOAX3DVE	Yes	1	1.5GHz	256KB	15W	64 Non-ECC DDR2-400, Unbuffered	One 16-lane@800MHz Full Duplex	Yes	No	No	Yes	95°C	ASBI	Lidless 812-BGA
208U	SML208UOAX3DVE	Yes	1	1.4GHz	256KB	12W	64 Non-ECC DDR2-400, Unbuffered	One 16-lane@800MHz Full Duplex	Yes	No	No	Yes	95°C	ASBI	Lidless 812-BGA
200U	SMF200UOAX3DVE	Yes	1	1.0GHz	256KB	8W	64 Non-ECC DDR2-400, Unbuffered	One 16-lane@800MHz Full Duplex	Yes	No	No	Yes	95°C	ASBI	Lidless 812-BGA

Note 1. As part of a comprehensive security program, AMD strongly recommends enabling Enhanced Virus Protection (EVP) and using up to date third party anti-virus software.

AMD EMBEDDED DISCRETE GRAPHICS

Model	Interface	Package	Memory	Engine/ Memory Clock	Power Management	TDP	Graphics	Video	DVI	LVDS	Analog RGB	DVO	TV	LVDS Display, Max Resolution	DVI Display, Max Resolution
ATI Radeon™ E2400	PCIe® 1.1 (x16, x8, x4, or x1) ¹	31mmx31mm BGA	128MB GDDR3 64-bit wide	600/700	PowerPlay™ 7.0 Technology	16W	DirectX® 10.0 compliant Shader Model 3.0 Open GL 2.0 support	ATI Avivo™ HD, Unified Video Decoder for H.264 and VC-1 decode. Motion video decode for HD-DVD/Blu-ray technology MPEG 1/2/4 decode and encode acceleration	1 Single-link & 1 Dual-link ²	18/24-bit Dual-link	2 Integrated Triple 10-bit DACs max Pixel CLK 400MHz	12-bit DDR or 24-bit SDR	YPbPr, NTSC and PAL	Dual-link: QXGA	Single-link: UXGA Dual-link: WUXGA
ATI Radeon™ E2400 MXM-II Module	PCIe® 1.1 (x16, x8, x4, or x1)	73mmx73mm MXM 21a Type II	256MB GDDR3 64-bit wide	600/700		18W	DirectX® 10.0 compliant Shader Model 3.0 Open GL 2.0 support	ATI Avivo™ HD, Universal Video Decoder for H.264 and VC-1 decode. Motion video decode for HD-DVD/Blu-ray technology MPEG 1/2/4 decode and encode acceleration	1 Single-link & 1 Dual-link ²	18/24-bit Dual-link	2 Integrated Triple 10-bit DACs max Pixel CLK 400MHz	12-bit DDR or 24-bit SDR	YPbPr, NTSC and PAL	Dual-link: QXGA	Single-link: UXGA Dual-link: WUXGA
ATI Radeon™ E4690	PCIe® 2.0 (x16, x8, x4, or x1)	35mmx35mm BGA	512MB GDDR5 128-bit wide	600/700	PowerPlay™ 7.0 Technology	25W	DirectX® 10.1 compliant Shader Model 4.0 Open GL 3.x support	ATI Avivo™ HD, Universal Video Decoder for H.264, VC-1 decode. Motion video decode for HD-DVD/Blu-ray technology MPEG 2 decode and encode acceleration	2 Single-link & 2 Dual-link	2 18/24-bit Dual-link	2 Integrated Triple 10-bit DACs max Pixel CLK 400MHz	12-bit DDR or 24-bit SDR	YPbPr, NTSC and PAL	Dual-link: QXGA	Single-link: UXGA Dual-link: WUXGA

Note 1. The dual-link DVI interface of the E2400 is multiplexed with the dual-link LVDS interface.

AMD EMBEDDED CHIPSETS

Model	Devices	CPU Interface	Package	PCI Express®	PCI	Graphics	ATI Hybrid CrossFire™	DVI/ HDMI	Display Port	LVDS	TV	DVO	SATA II	IDE	Power	USB	Audio	LPC	SPI	SMBus	Max GPIOs	Display, Max Resolution ¹
AMD M690T	M690T/ SB600	1GHz HyperTransport™	21mm FCBGA/ 23mm FCBGA	1x8, 4x1 Gen1	v2.3	DirectX® 9.0 WMMV9	No	1 @ 1080P ²	No	24-bit Dual-Channel	Yes	DVI & LVDS Transmitter Support ³	4, RAID 0, 1, 10 meets 1.0a spec	ATA 133	8W	10 v2.0	HD Audio, AC97 v2.3	2 LDRGs	Yes	Yes	73	2048 x 1536
AMD M690E	M690E/ SB600	1GHz HyperTransport™	21mm FCBGA/ 23mm FCBGA	1x8, 4x1 Gen1	v2.3	DirectX® 9.0 WMMV9	No	2 @ 1080P ²	No	24-bit Dual-Channel	No	DVI & LVDS Transmitter Support ³	4, RAID 0, 1, 10 meets 1.0a spec	ATA 133	8W	10 v2.0	HD Audio, AC97 v2.3	2 LDRGs	Yes	Yes	73	2048 x 1536
AMD 780E	780E/ SB710	2.6GHz HyperTransport™ 3.0	21mm FCBGA/ 21mm FCBGA	2x8 or 1x16, 6x1 Gen 2	v2.3	DirectX® 10.0 OpenGL 2.0, UVD 2.0	Yes	2 @ 1080P ⁴	Yes	24-bit Dual-Channel	No	No	6, RAID 0, 1, 10 meets 2.5 spec	ATA 133	13W	12 v2.0, 2 v1.1	HD Audio, AC97 v2.3	2 LDRGs	Yes	Yes	73	2560 x 1600
AMD SR5690, SR5670, SR5650/ SP5100	SR56x0/ SP5100	HyperTransport 3.0 (5.2GT/s) Backward Compatible with HT 1.0	29x29mm FCBGA/ SP5100: 21x21mm FCBGA	PCI-E Gen2 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	12 v2.0, 2 v1.1	HD Audio, AC97 v2.3	2 LDRGs	Yes	Yes	73	N/A

Note 1. Capable display resolutions are influenced by the operating system driver, processor and memory selection.

Note 2. The PCI Express® x8 interface is multiplexed with a TMDS interface, enabling DVI or HDMI 1.2 with HDCP 1.1 support.

Note 3. 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.

Note 4. 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.

AMD Embedded Solutions

Product Selection Guide

AMD Geode™ Solutions Based Reference Design Kits

Name	Processor	Companion Device	Form Factor (Inches)	Video Output	OS ¹			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/	Parallel Port	iDA				
LX ETX	AMD Geode™ LX 800@0.9W ²	AMD CS5536	3.7x4.5	CRT/TFT	●	5.0	●		4					1	SVDC thru ETX conn.									
LX Ultra Value Client	AMD Geode™ LX 800@0.9W ²	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 ²	AMD CS5536	4.5x6.5	CRT/TFT/LVDS	●	5.0	●	2	4	Mini PCI			●	1	Mini-ITX		●	2	●	●				
LX Network Attached Storage Processor	AMD Geode™ LX 800@0.9W or LX 700@0.8W ²	AMD CS5536	Mini-ITX	CRT for debug only	●		●		3					1	ATX	1	●	2						

Note 1. OS support typically includes BIOS and drivers for audio, display, and bootloader if required.

Note 2. 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/connectivity/solutions/geode/benchmark>

AMD64 Reference Design Kits

Name	Processor Support	Chipset	Form Factor	Topology	OS		I/O Connectors										Electrical/Mechanical				
					Windows® XP/XPe	Linux®	Display	Ethernet	Aux Slots	IDE	SAS	SATA	Audio	USB	Serial	Standard	NEBS	Compliance			
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		●					2	1	Core Specification PICMG 3.0	NEBS Level-3 and ETSI Installations	RoHS Compliant
AMD Socket S1 Processor ODM Express	AMD Turion™ 64 X2, Mobile AMD Sempron™ Processors	AMD M690T/E with ATI Radeon™ X1250 Graphics	COM Express Type 2	N/A	●	●	DVI, LVDS, Analog VGA, TV	1G	3x1 PCIe®, 1x8 PCIe, PCI	2Ch			4	HD	8				COM.0		RoHS Compliant
AMD Socket AM2 Processor Storage Bridge Bay	AMD Athlon™ and AMD Athlon™ X2 Processors	Broadcom HT-2100, HT-1000	SBB 2.0	N/A		●	Analog VGA	GbE to back plate, GbE to mid-plane	1x8 PCIe	●	●	●		1	1			SBB 2.0		RoHS Compliant	
AMD Sempron™ 210U/200U Processor Mini-DTX	ABS1 BGA Processors	AMD M690E with ATI Radeon™ X1250 Graphics	Mini-DTX	N/A	●	●	DVI VGA	1G	2x1 PCIe	●				2	HD	6			Mini-DTX		RoHS Compliant

AMD Development Boards

Name	Processor (* Denotes Processor shipped in Kit)	Chipset	Form Factor	Display Output	OS ¹			I/O Connectors												Typical Kit Contents						
					Windows® XP/XPe	Windows CE 4.2	Windows CE 5.0	Linux® 2.4.x	Linux 2.6.x	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	iDA	DVI/HDMI Adapter Board
AMD GEODE™ SOLUTIONS BASED DEVELOPMENT BOARDS																										
LX DB800	AMD Geode™ LX 800@0.9W ²	AMD CS5536	Mini-ITX/ETX	CRT, TFT	●	●	●	2	4			1 ²		1	1	1	ATX		●	3	1	1	1		●	
AMD64 BASED DEVELOPMENT BOARDS																										
S1 DBM690T/E	Mobile AMD Sempron™ 3500+* and 2100+, AMD Turion™ 64 X2 TL-S2, AMD Sempron 2100+	AMD M690T or M690E, SB600	ATX	CRT, DVI/HDMI, LVDS	●		●	7.1	9	1x16 ⁴ 1x1	●	3	●	1	1	1	ATX	4	●	1	1	1		●		
AM2+ DB790E	AMD Phenom™ 9350e, AMD Athlon™ X2 4200+ and 3400e, AMD Athlon 3100+ and 2000+	AMD 780E, SB710	µATX	CRT, DVI	●		●	7.1	12	1x16, 1x4		1			1	1	ATX	6	●	1				●		

Note 1. OS support typically includes BIOS and drivers for audio, display, and bootloader if required.

Note 2. The Geode LX 800@0.9W processor operates at 500MHz. Model numbers reflect performance as described here: <http://www.amd.com/connectivity/solutions/geode/benchmark>. DDR2 versions available - please talk with your AMD representative

Note 3. The Geode LX DB800 has one 32-bit, 66/33MHz, 3.3V (non-5V tolerant) PCI slot. Additionally, a bridge card that offers two 32-bit, 66/33MHz, 3.3V (5V tolerant) slots is shipped with the development board. The bridge card occupies the one slot on the main board.

Note 4. The S1 DBM690T/E has one x16 PCI Express® slot that is supported by a 1x8 PCI Express interface.

www.amd.com/embedded

One AMD Place

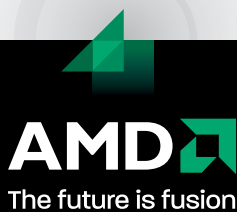
P.O. Box 3453

Sunnyvale, CA 94088-3453, USA

Tel: 408-749-4000 or 800-538-8450

TWX: 910-339-9280

TELEX: 34-6306



©2009 Advanced Micro Devices, Inc. All rights reserved. AMD, the AMD Arrow logo, ATI, the ATI logo, AMD Athlon, AMD Opteron, AMD Turion, AMD Sempron, AMD Phenom, AMD Digital Media Xpress, AMD Virtualization, AMD-V, AMD PowerNow!, 3DNow!, Geode, PowerPlay, Radeon, and Avivo and combinations thereof are trademarks of Advanced Micro Devices. AdvancedTCA, ATCA, and AMC are registered trademarks of PCI Industrial Computers Manufacturers Group. HyperTransport is a licensed trademark of the HyperTransport Technology Consortium. Microsoft, Windows and DirectX are registered trademarks of Microsoft Corporation in the U.S. and/or other jurisdictions. Linux is a registered trademark of Linus Torvalds. MMX is a trademark of Intel Corporation. PCIe and PCI Express are registered trademarks of PCI-SIG. Other names are for informational purposes only and may be trademarks of their respective owners. 43838F