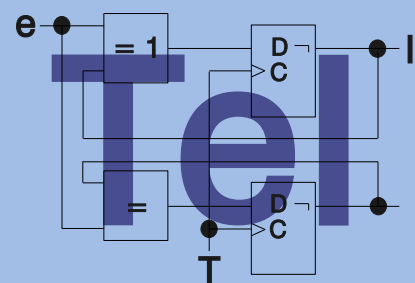


Untersuchung und Vorstellung der GEODE- Prozessorarchitektur

Martin Schöffel

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- Motivation
- Ursprung
- Varianten
 - Geode™ GX
 - Geode™ SC
 - Geode™ LX
 - Geode™ NX
- Geodelink

- x86 für Embedded- Bereich
 - volle x86 - Funktionalität
 - hohe Verbreitung des x86er erspart Softwareentwicklungskosten
- Geringer Energieverbrauch
- Geringe Wärmeentwicklung
- Geringer Platzbedarf
 - thin clients
 - interactive set-top boxes
 - single-board computers
 - Personal Access Devices (PADs)
 - mobile Internet and entertainment

➤ Cyrix MediaGX

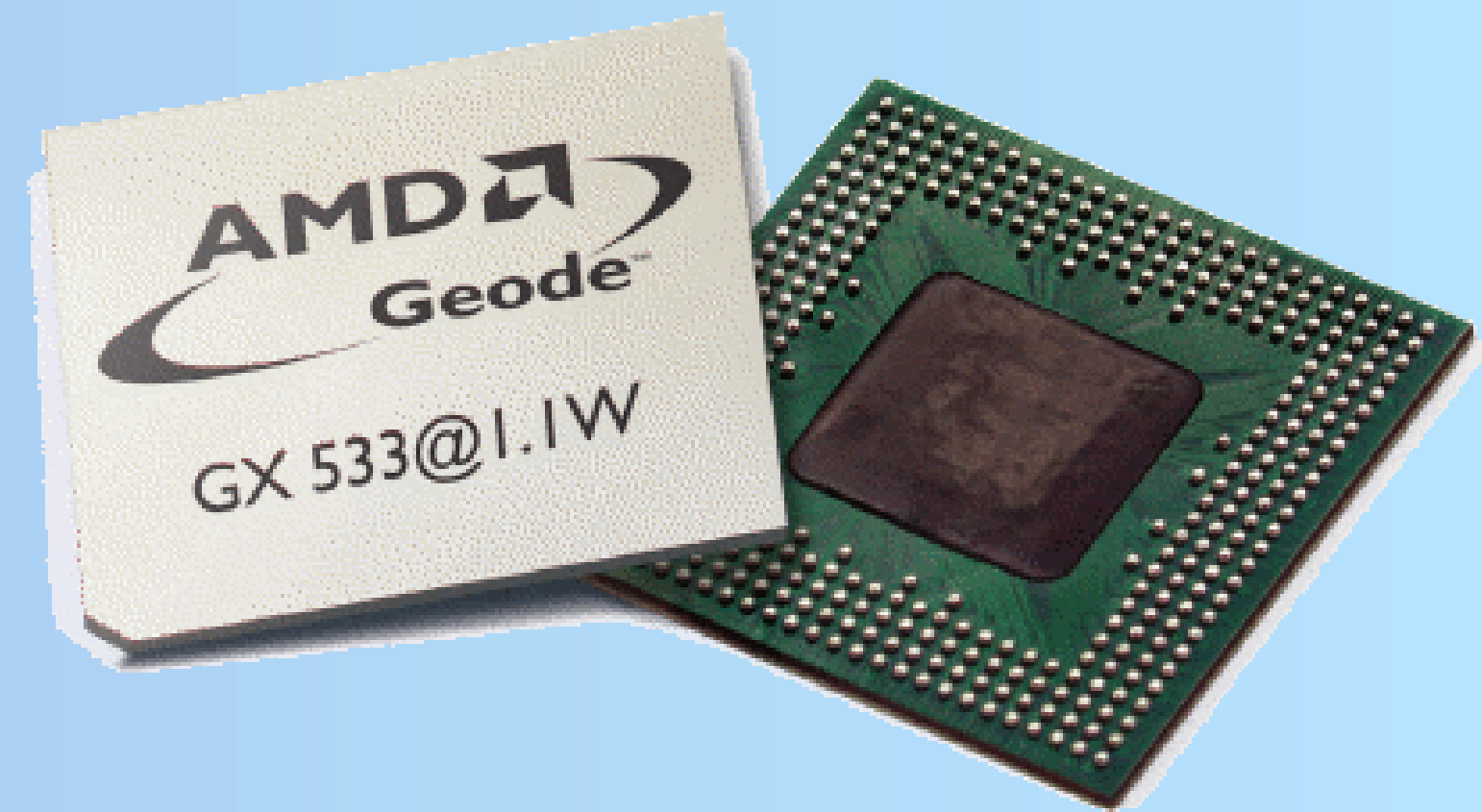
- Verkauf Cyrix an National Semiconductor
- Weiterverkauf von Cyrix an VIA Technologies ohne SoC-Bereich

➤ National Geode GX1 und GX2

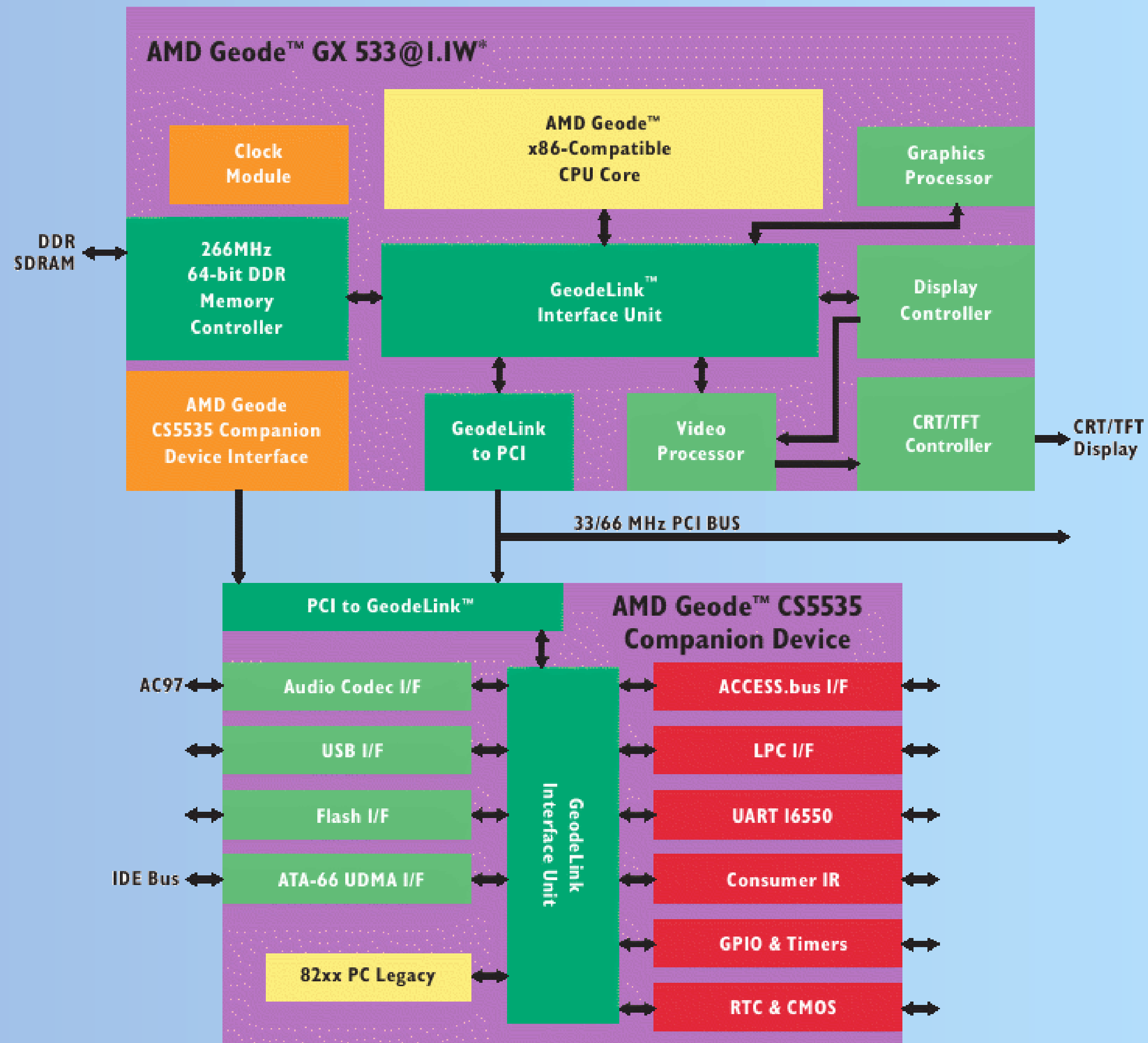
- Weiterverkauf an AMD
- Lizenzierung an „Chinese Ministry of Science and Technology“



- Geode™ GX 533@1.1W
 - 400MHz
- Geode™ GX 500@1.0W
 - 366MHz
- Geode™ GX 466@0.9W
 - 333MHz



- L1 cache: 16KB instruction + 16KB data
- 6 GB/s interne GeodeLink™ Interface Unit (GLIU)
- Integrierter Memory- Controller
- Integrierter Grafik- Prozessor
- Integrierter Display- Controller
 - CRT/TFT
- GeodeLink Interface (basierend auf dem Sockel 7)

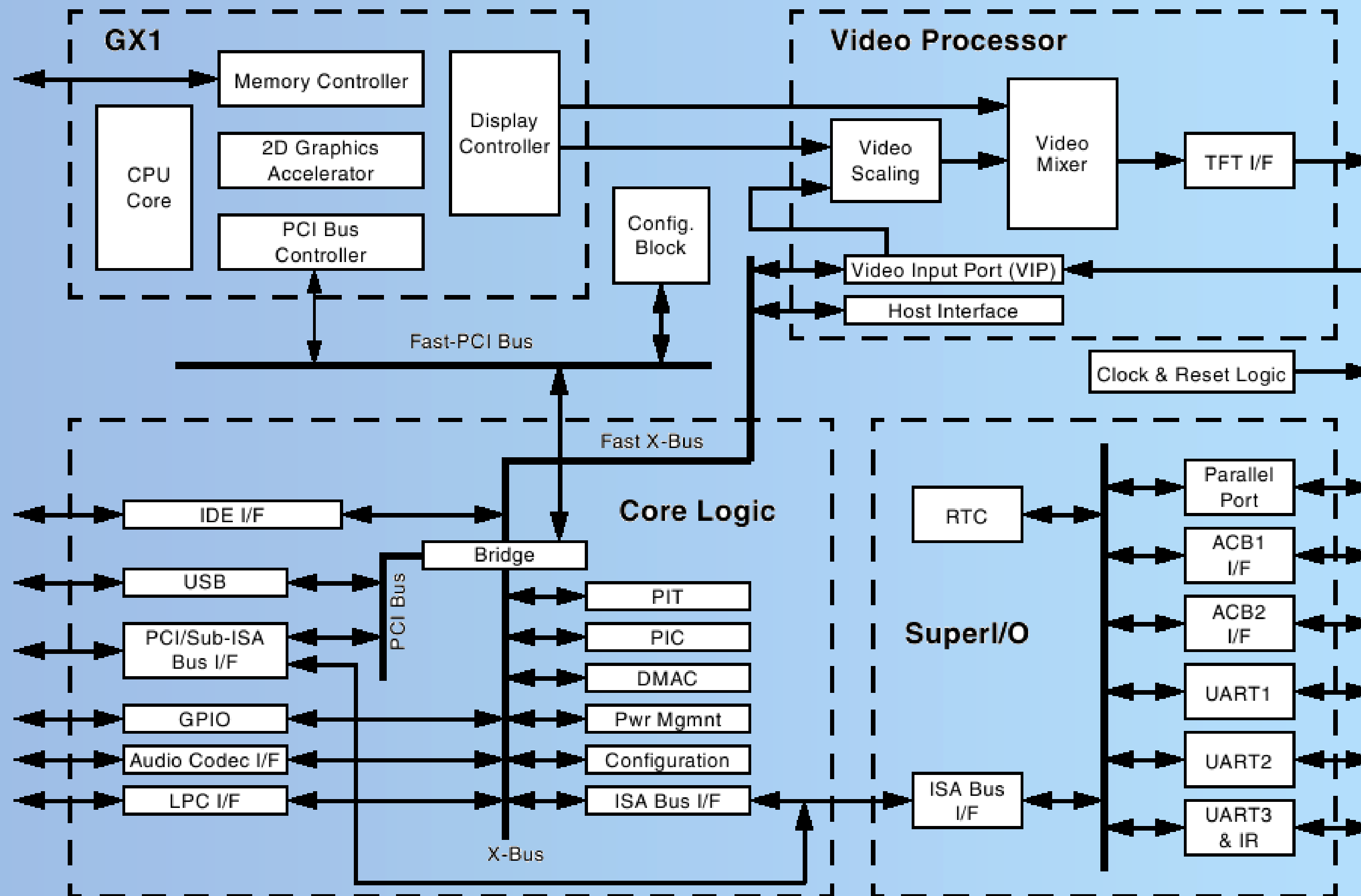


➤ GX- SoC- Varianten:

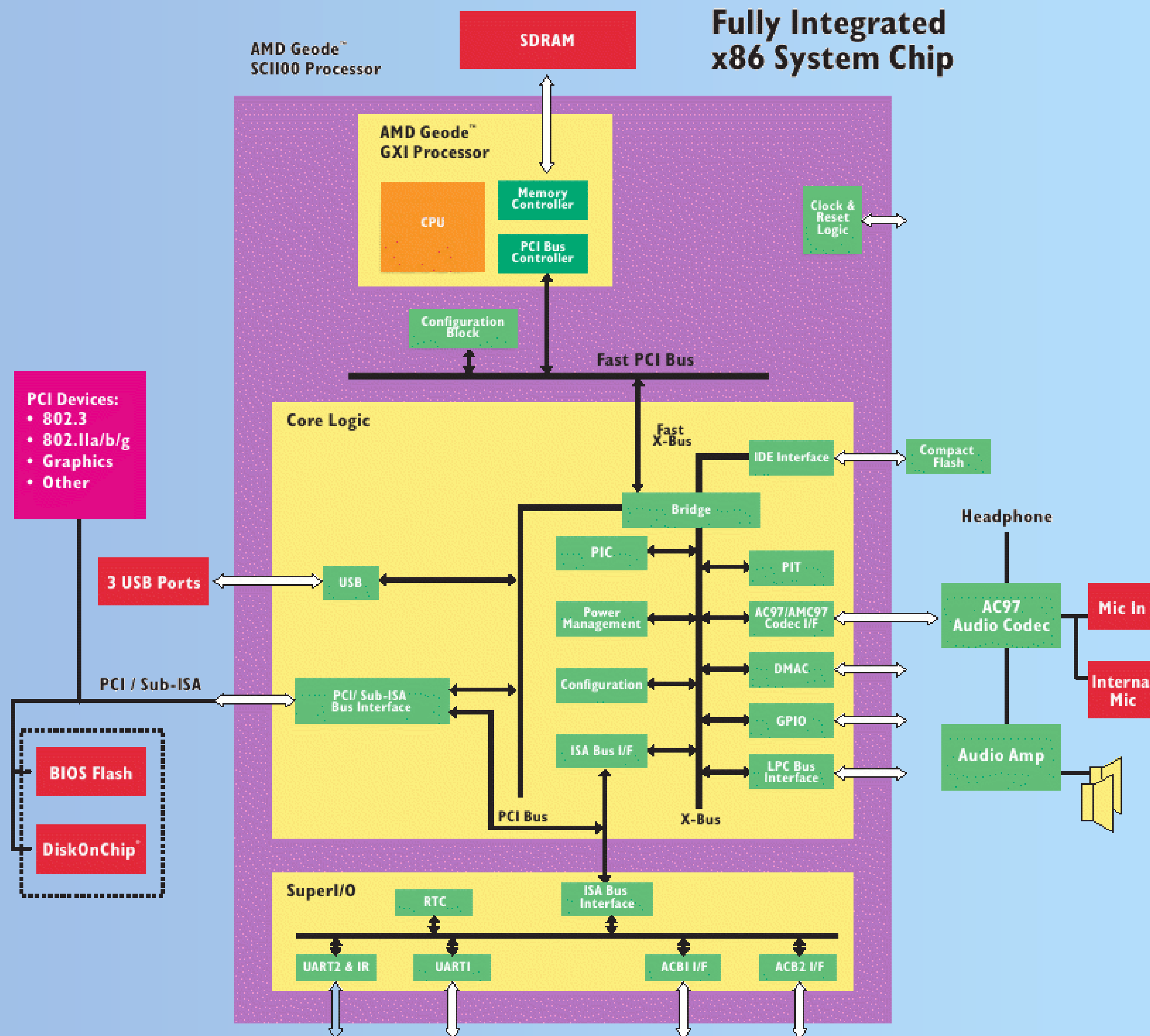
- Geode™ SC1100
 - 266MHz@3.3W
- Geode™ SC1200/SC1201
 - CRT,TFT,TV
- Geode™ SC2200
 - 300MHz@4.1W
 - 266MHz@3.1W
 - 233MHz@2.9W
 - CRT,TFT
- Geode™ SC3200
 - 266MHz@3.0W
 - 233MHz@2.8W
 - TFT



AMD Geode™ SC 3200

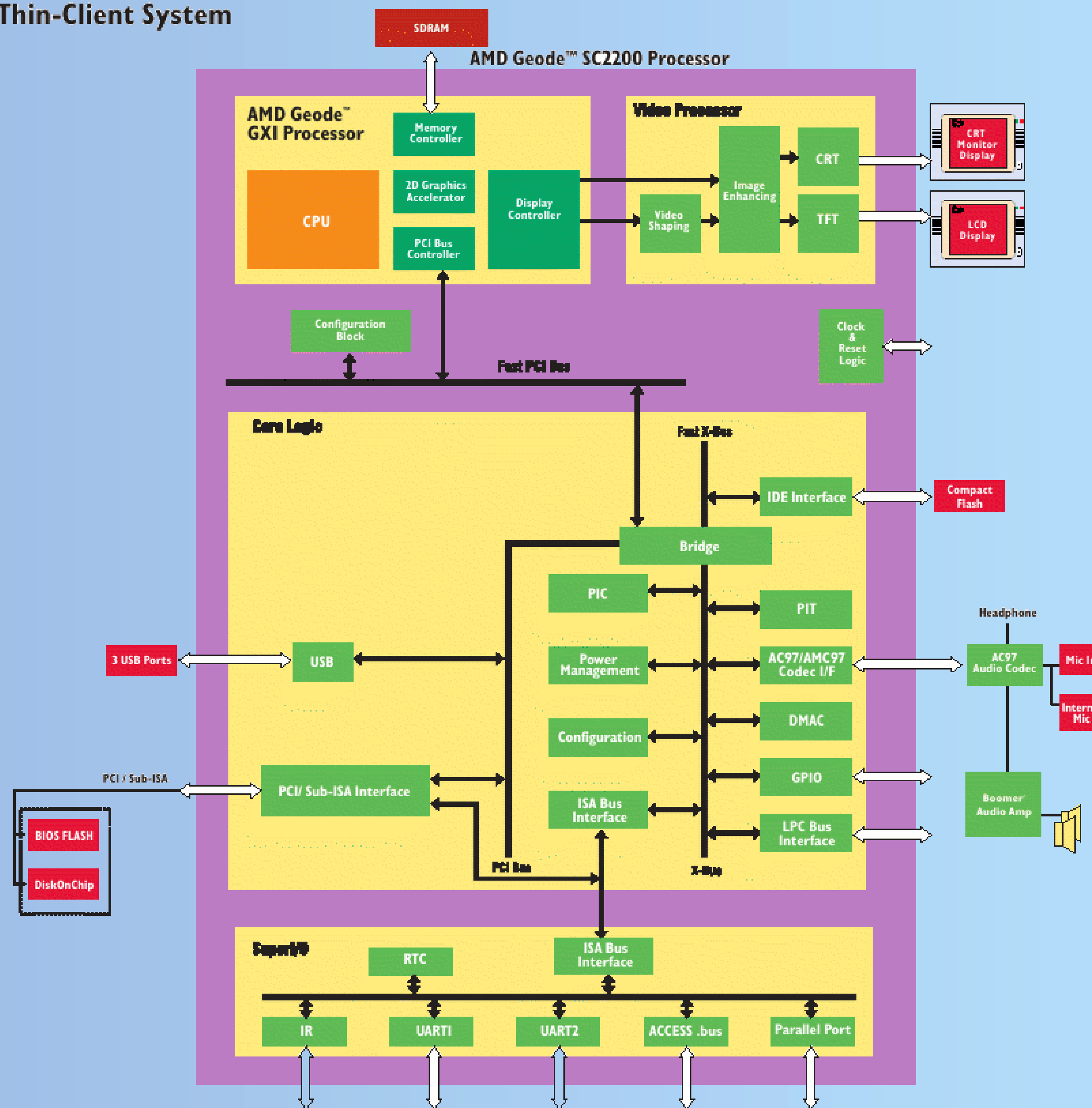


AMD Geode™ SC 1100

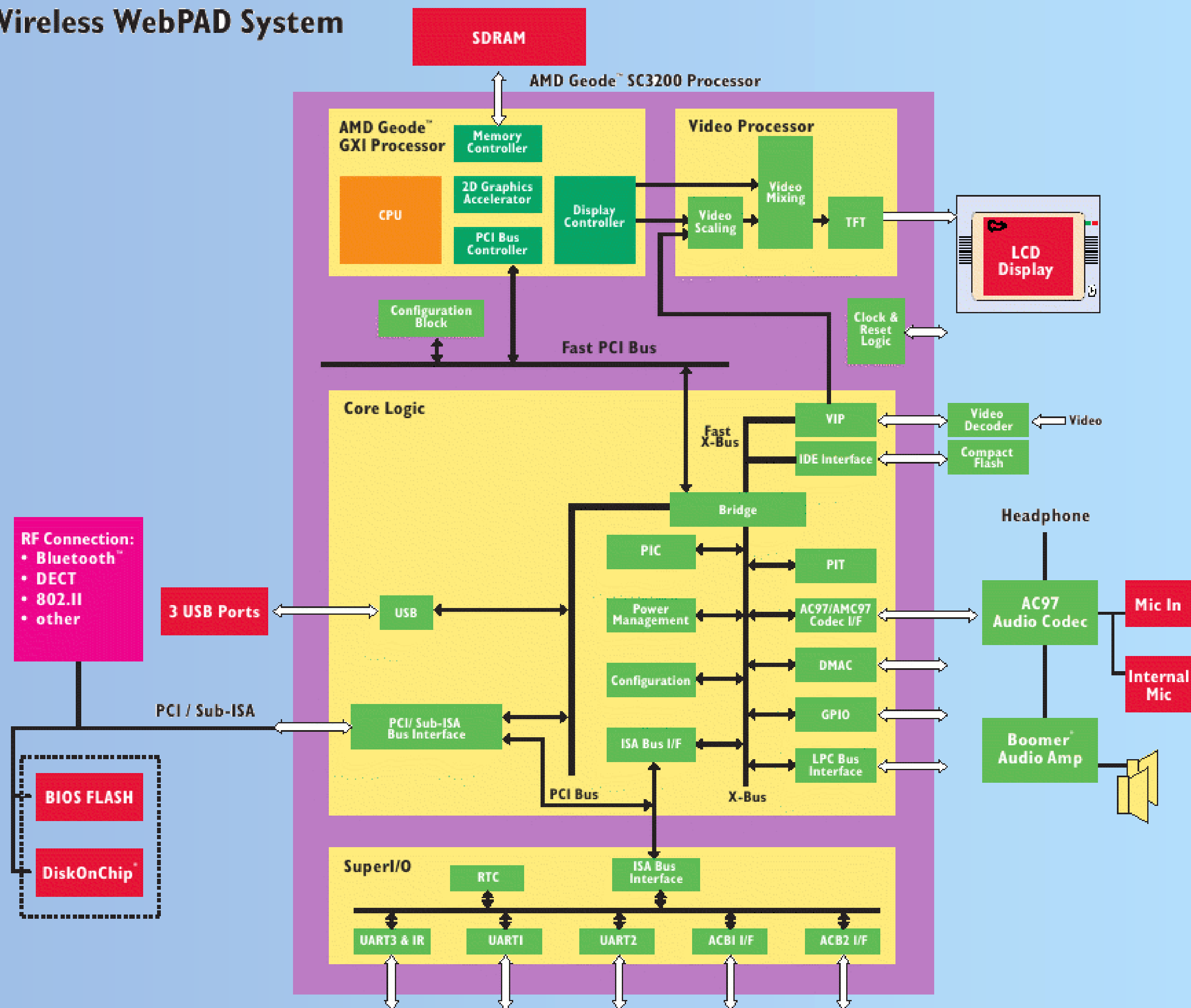


AMD Geode™ SC 2200

Thin-Client System



Wireless WebPAD System



➤ AMD Geode™ LX 700@0.8W

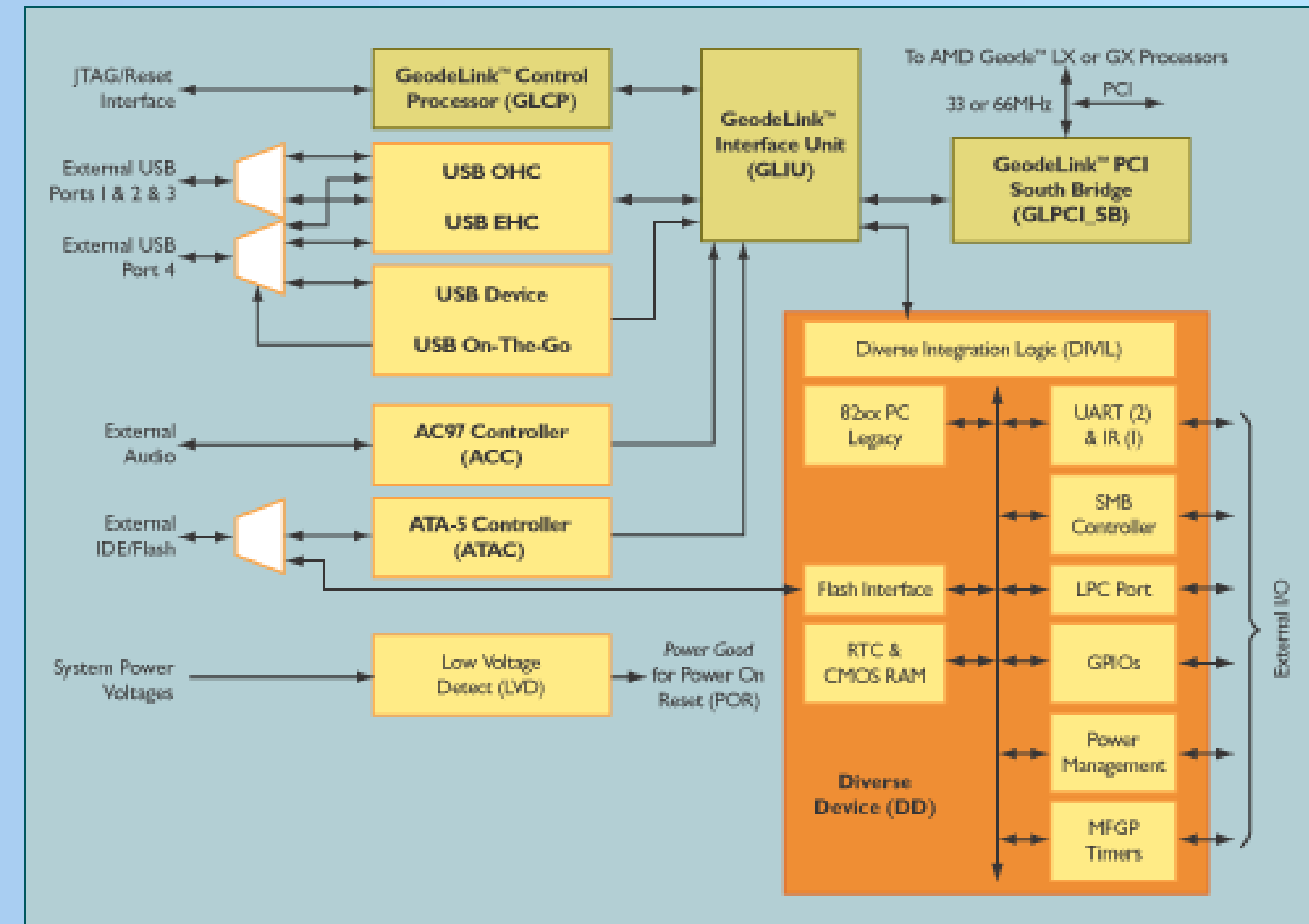
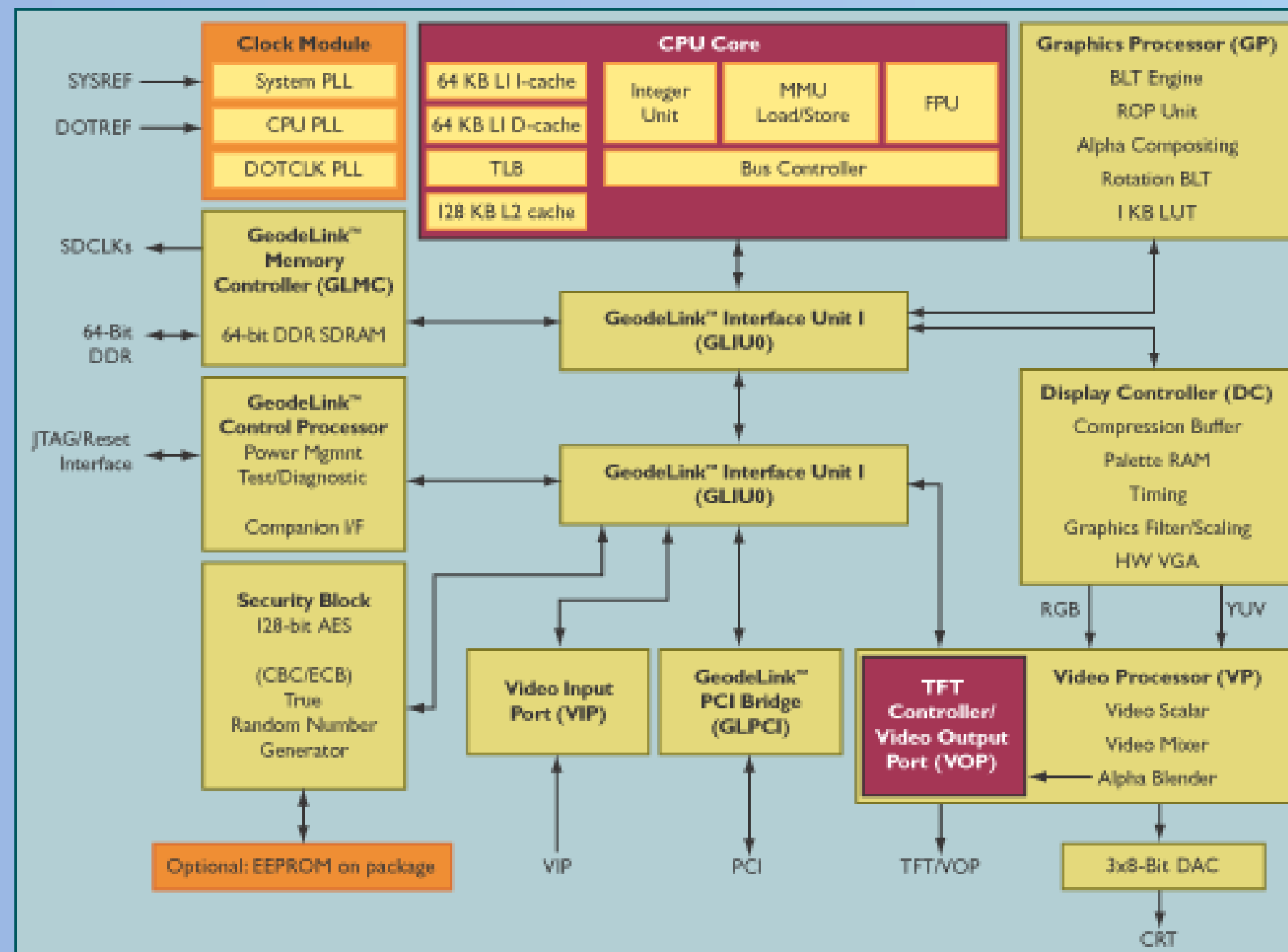
- 433MHz
- Maximal 3.1W
- Durchschnittlich 1.3W

➤ AMD Geode™ LX 800@0.9W

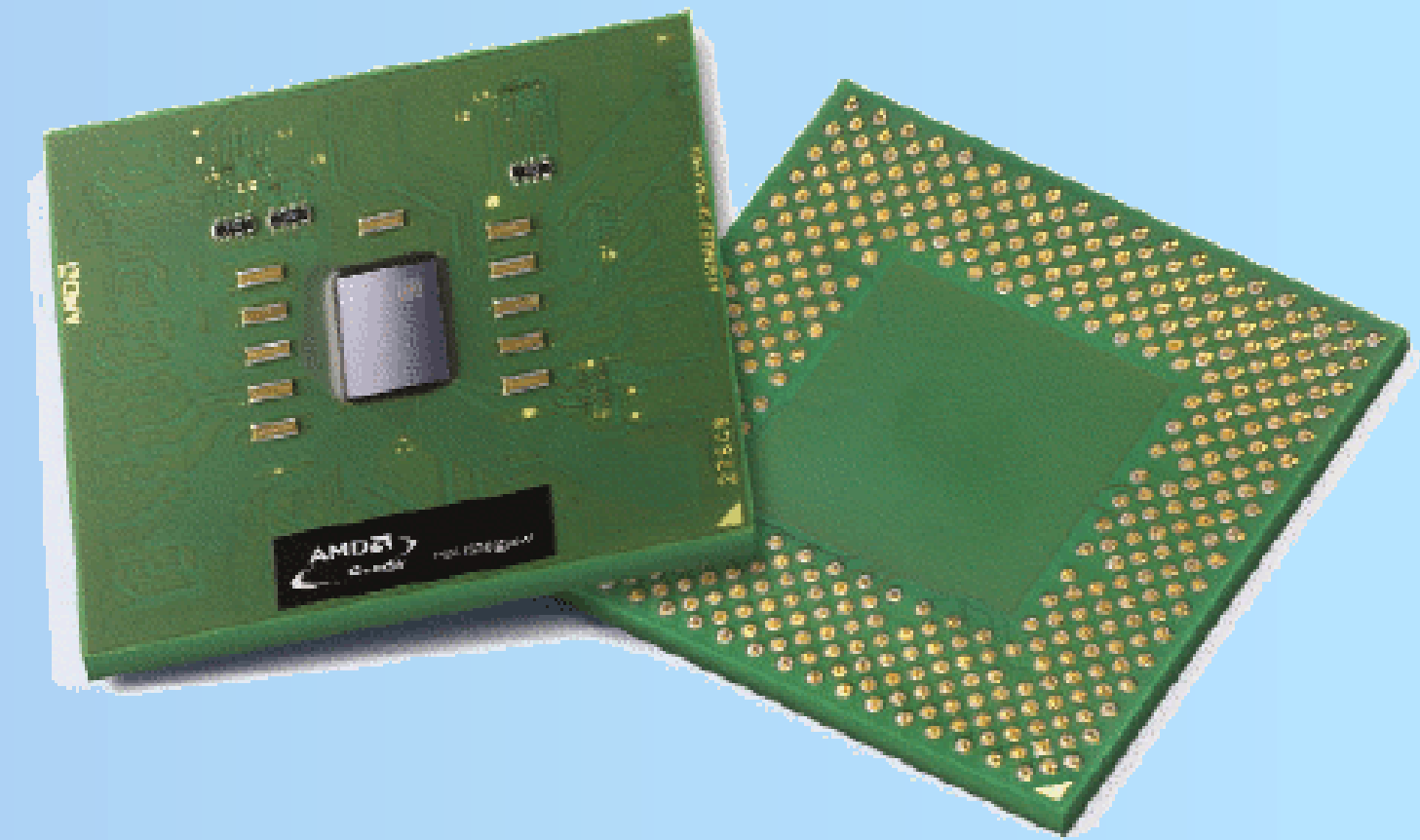
- 500MHz
- *„The AMD Geode™ LX 800@0.9W processor delivers the most performance per watt in the industry today“*
- Maximal 3.9W
- Durchschnittlich 1.8W



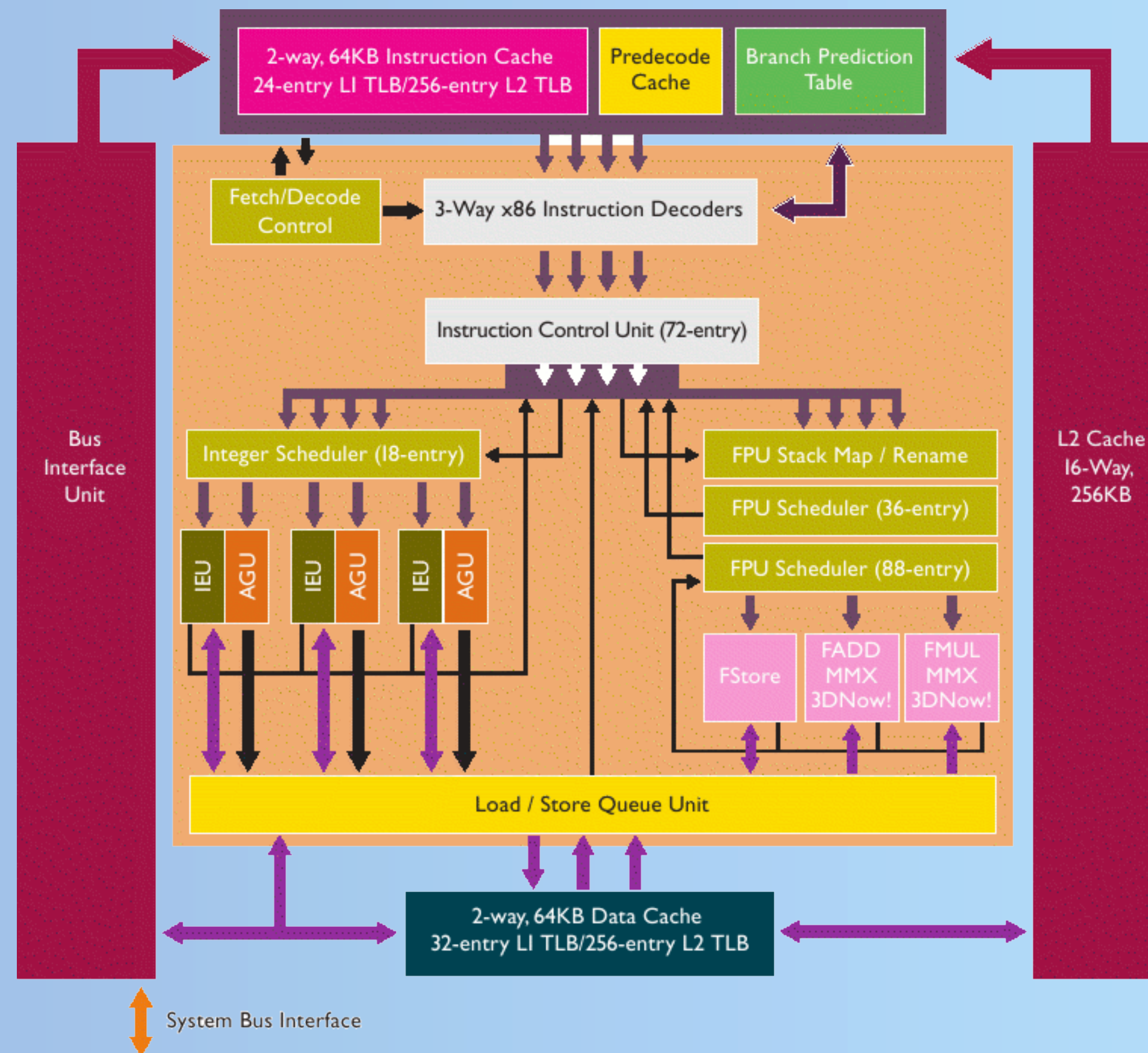
- x86/x87-compatible core
- L1 cache: 64K instruction + 64K data
- L2 cache: 128K
- Integrierter Memory Controller
- 9 GB/s interne GeodeLink™ Interface Unit (GLIU)
- **Security Block**
 - 128-bit AES (CBC/ECB)
 - True Random Number Generator
- Integrierter Grafik- Prozessor
- Integrierter Display controller
 - CRT/TFT
- GeodeLink Interface (basierend auf dem Sockel 7)



- Geode™ NX 1250@6W
 - 667MHz
 - Max 9W
- Geode™ NX 1500@6W
 - 1GHz
 - Max 9W
- Geode™ NX 1750@14W
 - 1.4GHz
 - Max 25W



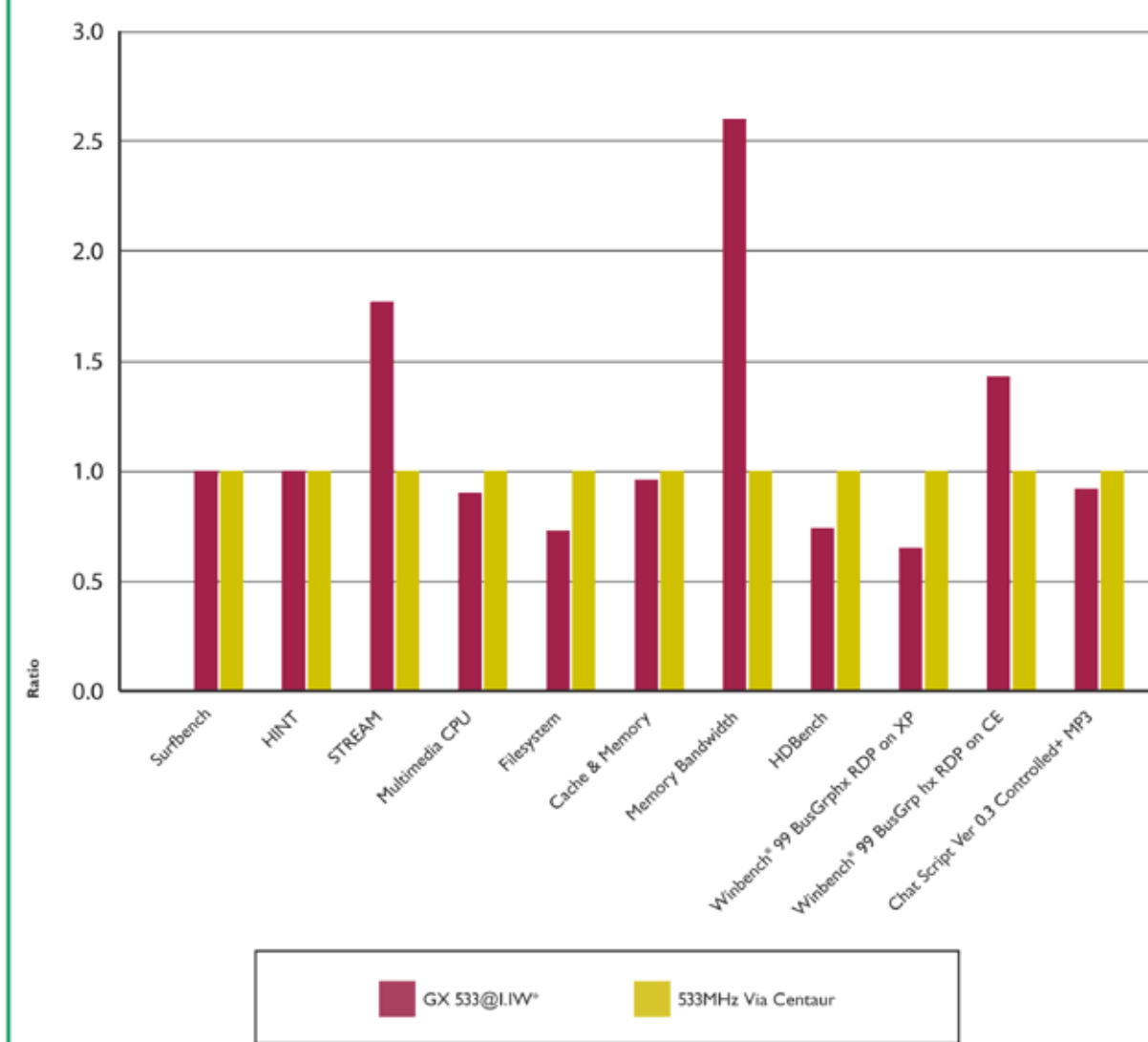
- Basierend auf AMD Athlon™ - Prozessorkern
- L1 cache: 128K
- L2 cache: 256K (+hardware data prefetch)
- Socket A (Socket 462)



	GX	SC	LX	NX
Max MHz	400	300	500	1400
Max Watt	3,5	4,1	3,9	25
MMX		Y	Y	Y
3Dnow!	Y	N	Y	Y
SSE		N	N	Y
AES		N	Y	N
Geodelink		Y	Y	N
Speicher	DDR	SD	DDR	DDR
Kern	x86/x87		x86/x87	Athlon

Benchmarks Graph

AMD Geode™ GX 533@1.1W Processor* vs. 533MHz Via Centaur Processor



*This processor operates at 400MHz. Model numbers reflect performance as described here: <http://www.amd.com/connectivitysolutions/geodegbenchmark>.

Benchmark System Configuration AMD Geode™ GX 533@1.1W processor vs. Via Centaur

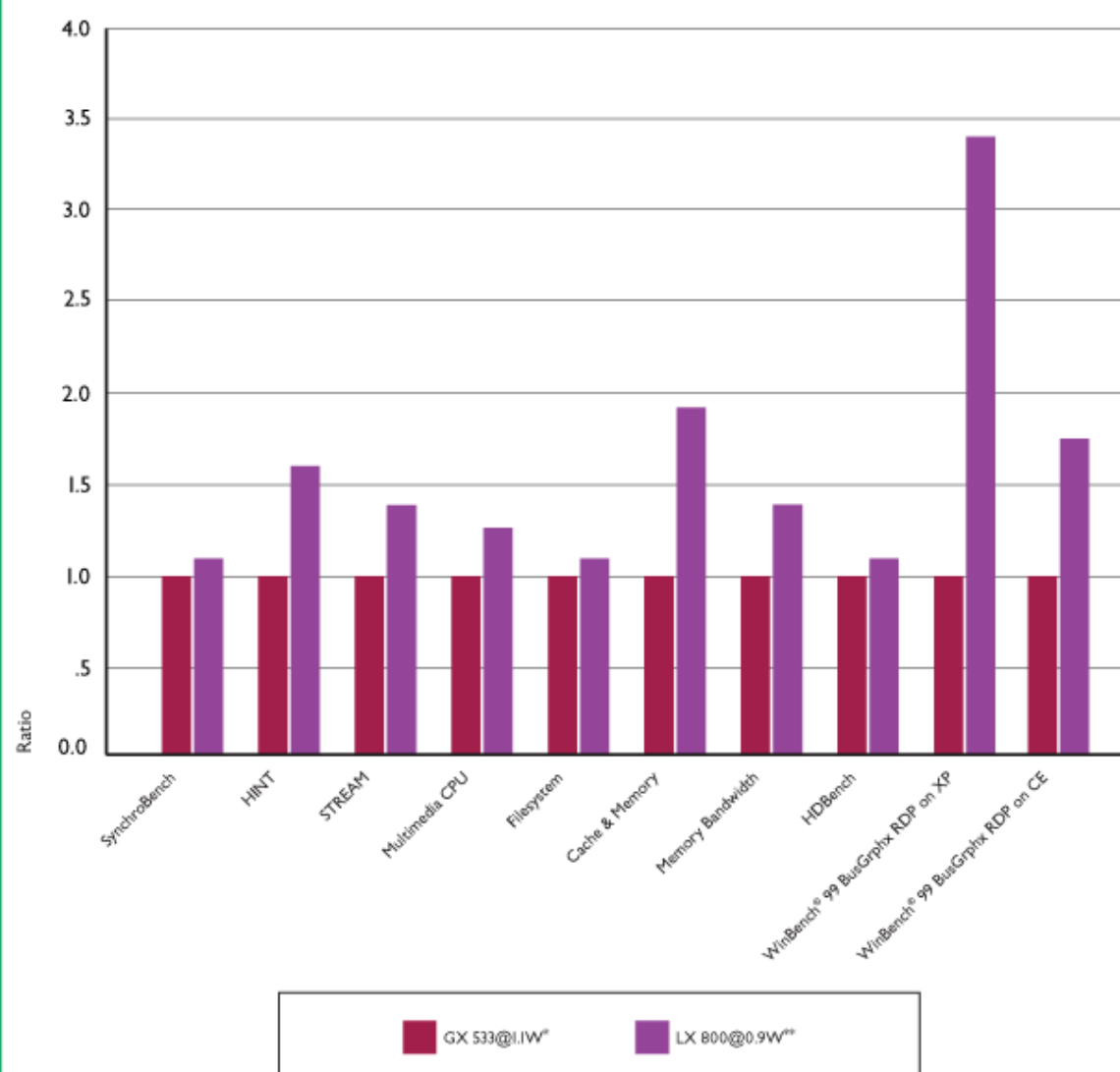
AMD Geode™ GX 533@1.1W processor – Speed: 400MHz; RAM: DDR 256MB (shared); Hard Disk: Western Digital WD 800JB 80GB; Motherboard: SP444GX22; OS: Windows® XP Home.

Via Centaur processor – Speed: 533MHz; RAM: 256MB SDRAM (shared) CAS3; Front Side Bus: 133MHz; Hard Disk: Maxtor 60GB; Motherboard: EPIA-M; OS: Windows XP Home.

31408A-01

Benchmarks Graph

AMD Geode™ GX 533@1.1W Processor* vs. AMD Geode™ LX 800@0.9W Processor**



*This processor operates at 400 MHz. Model numbers reflect performance as described here: <http://www.amd.com/connectivitysolutions/geodegbenchmark>.

**This processor operates at 500MHz. Model numbers reflect performance as described here: <http://www.amd.com/connectivitysolutions/geodelxbenchmark>.

Benchmark System Configuration AMD Geode™ GX 533@1.1W processor vs. AMD Geode™ LX 800@0.9W processor

AMD Geode™ GX 533@1.1W processor – Speed: 400MHz; RAM: DDR 256MB (shared); Hard Disk: Western Digital 80GB; Motherboard: Hawk; OS: Windows® XP Home, Windows® CE.

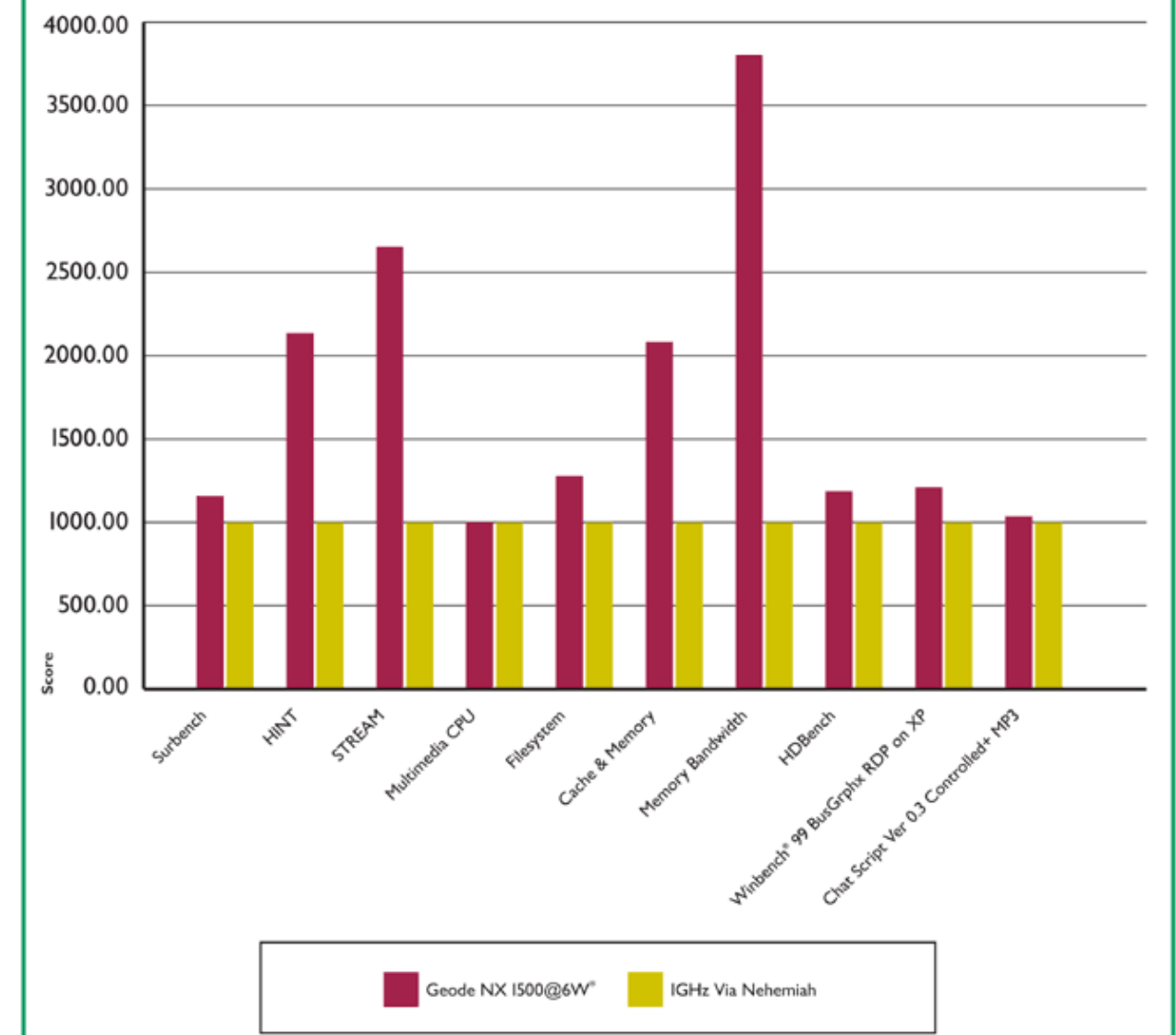
AMD Geode™ LX 800@0.9W processor – Speed: 500MHz; RAM: DDR 256MB (shared); Hard Disk: Western Digital 80GB; Motherboard: Hawk; OS: Windows® XP Home, Windows® CE.

WinBench is a registered trademark of Ziff Davis, Inc.

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Benchmarks Graph

AMD Geode™ NX 1500@6W Processor* vs. 1GHz Via Nehemiah Processor



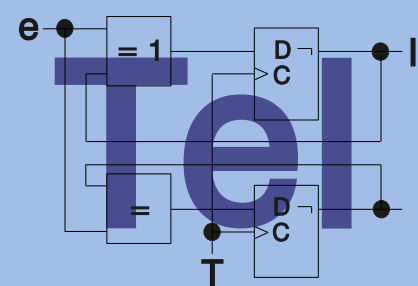
*This processor operates at 1GHz. Model numbers reflect performance as described here: <http://www.amd.com/connectivitysolutions/geodenxbenchmark>.

Benchmark System Configuration AMD Geode™ NX 1500@6W processor vs. Via Nehemiah

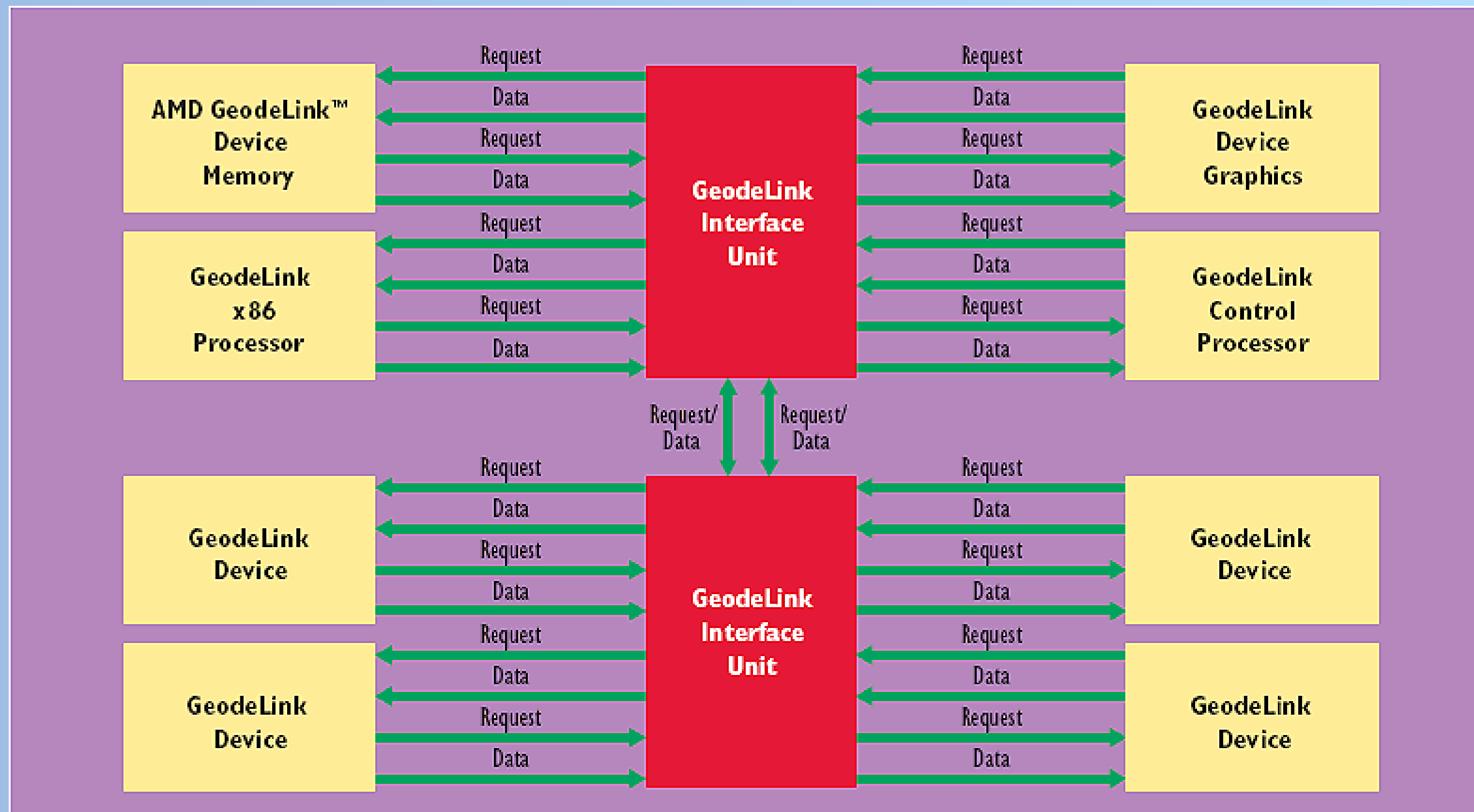
AMD Geode™ NX 1500@6W processor – Speed: 1GHz; RAM: DDR 256MB (shared); Front Side Bus: 266MHz; Hard Disk: Maxtor 120GB; Motherboard: Modified ASUS A7V8X-MX; OS: Windows® XP Home.

Via Nehemiah processor – Speed: 1GHz; RAM: DDR 256MB (shared); Front Side Bus: 133MHz; Hard Disk: 18GB; Motherboard: EPIA-M; OS: Windows XP Home.

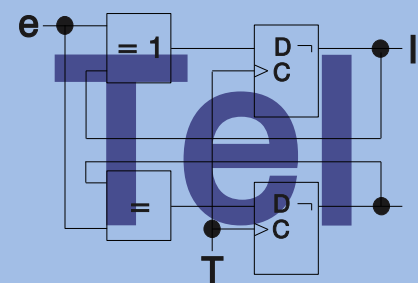
31408A-03



- 9Gbps High-bandwidth interface
- Standard bus interface for modular reusable IP
- Bis zu 31 pipelined transactions
- out-of-order data streams
- peer-to-peer Kommunikation
- „on-the-fly“ Zugriffs- Priorisierung von Echtzeit- und Isochronen Baugruppen
- Verschiedene Busbreiten (16 - 256 Bit)
- Verschiedene Taktraten (33 - 300 Mhz)
- dynamic allocation of memory bandwidth
- Standard- Bridges für Xbus und PCI
- Advanced Hardware Power Management (unabhängig von BS)
- standard test and scan interface (JTAG)
- On-chip logic analyzer Funktionen



- www.amd.com
- www.wikipedia.org



Aussprache von „Geode“

- Geode „[j E ' O d]“ (engl. für Druse)
- „Gee-Ooo-Dee“
- „Gee-ode“ / "gee owed"

