



AMD-K6™ MMX™ Enhanced Processor Product Roadmap



Agenda



- **AMD Super7 Platform Initiative**
 - Advancing the Socket 7 Platform
- **AMD-K6™ Product Roadmap**
 - AMD-K6™ 3D
 - AMD-K6+ 3D
- **AMD-3D™ Technology**
 - 3D Multimedia Instruction Set

Super7: Socket 7 Enhancement Initiative **AMD**

- **Key Performance Enhancements**
 - Addition of AGP in '97
 - Higher local bus frequency - 100 MHz
 - Support for 100 MHz frontside cache
 - Maintains socket 7 compatibility and cost advantages
- **At Leading Edge of all System Feature Advancements**
 - Today: USB, SDRAM, UDMA, ACPI
 - Future: AGP, PC 98, 100 MHz bus, 100 MHz SDRAM, 1394, etc
- **System Logic Vendors: ALi, National, SiS, VIA and AMD**

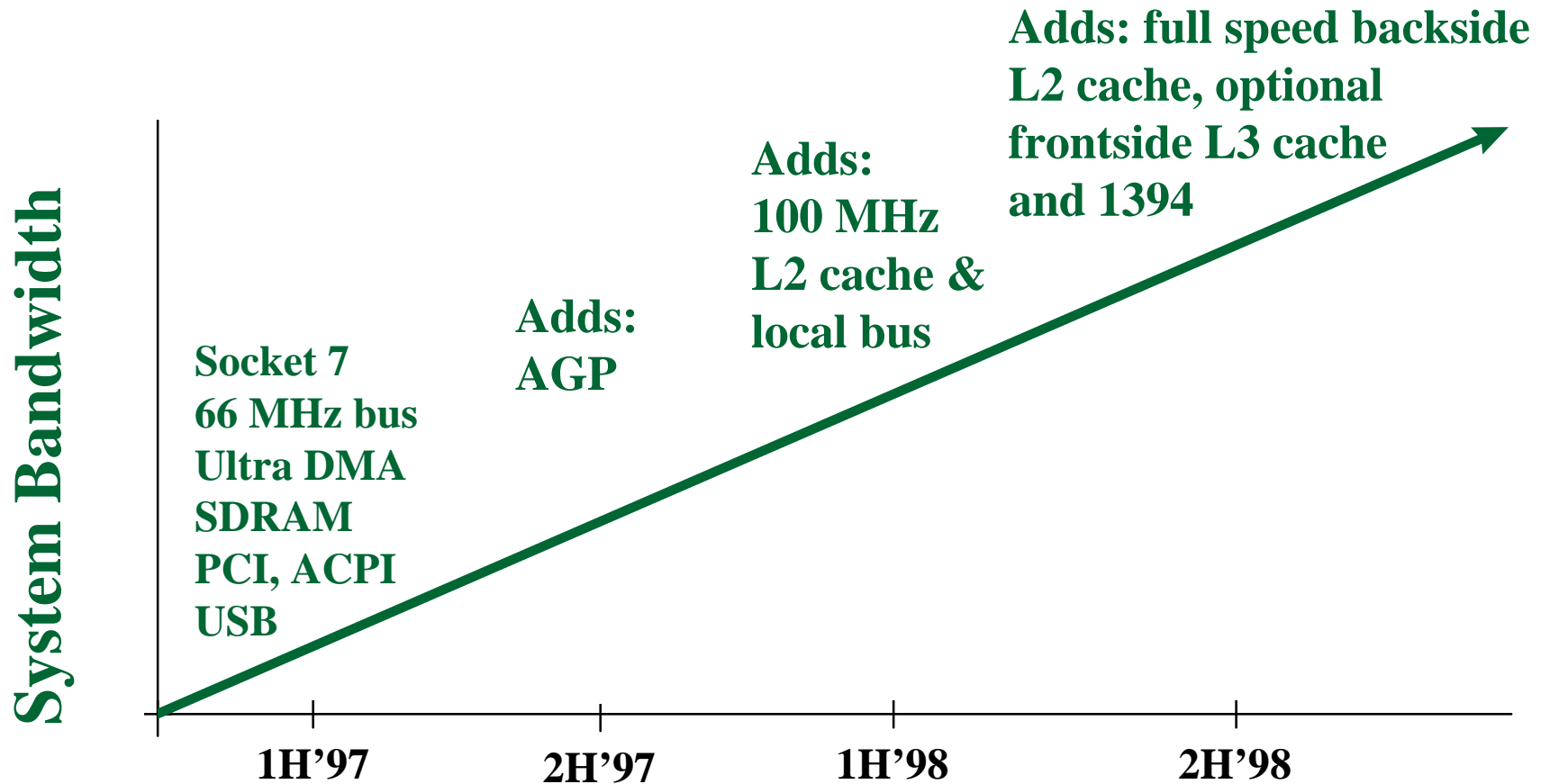
AMD is committed to leading the socket 7 infrastructure to higher performance!

AMD-K6™ Super7 Roadmap

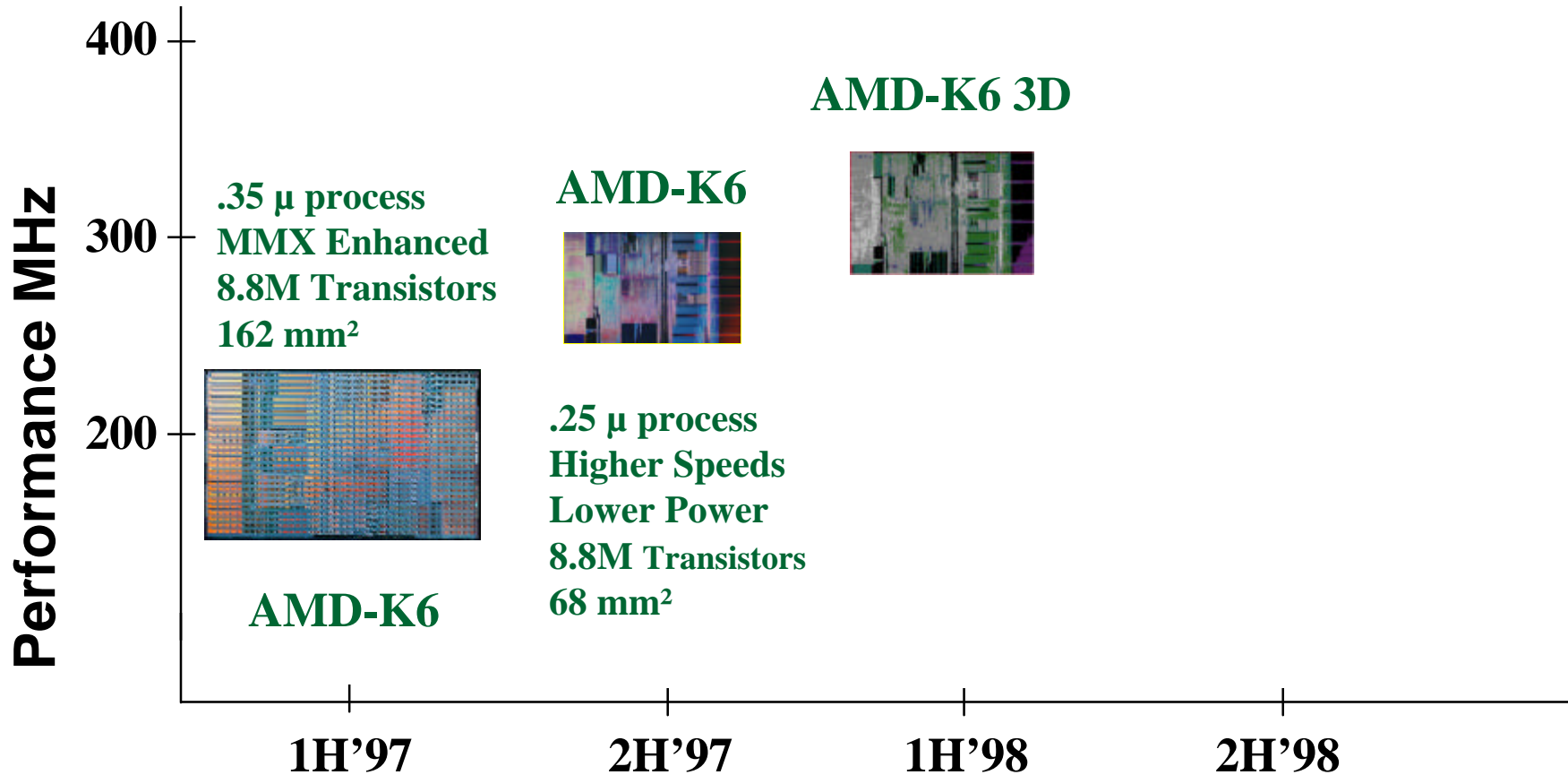


“For a uniprocessor system, the Pentium® bus is just as good as - if not better than - the P6 bus.”!

Michael Slater, Microprocessor Report Dec 30, 1996



AMD-K6™ Processor Family Roadmap

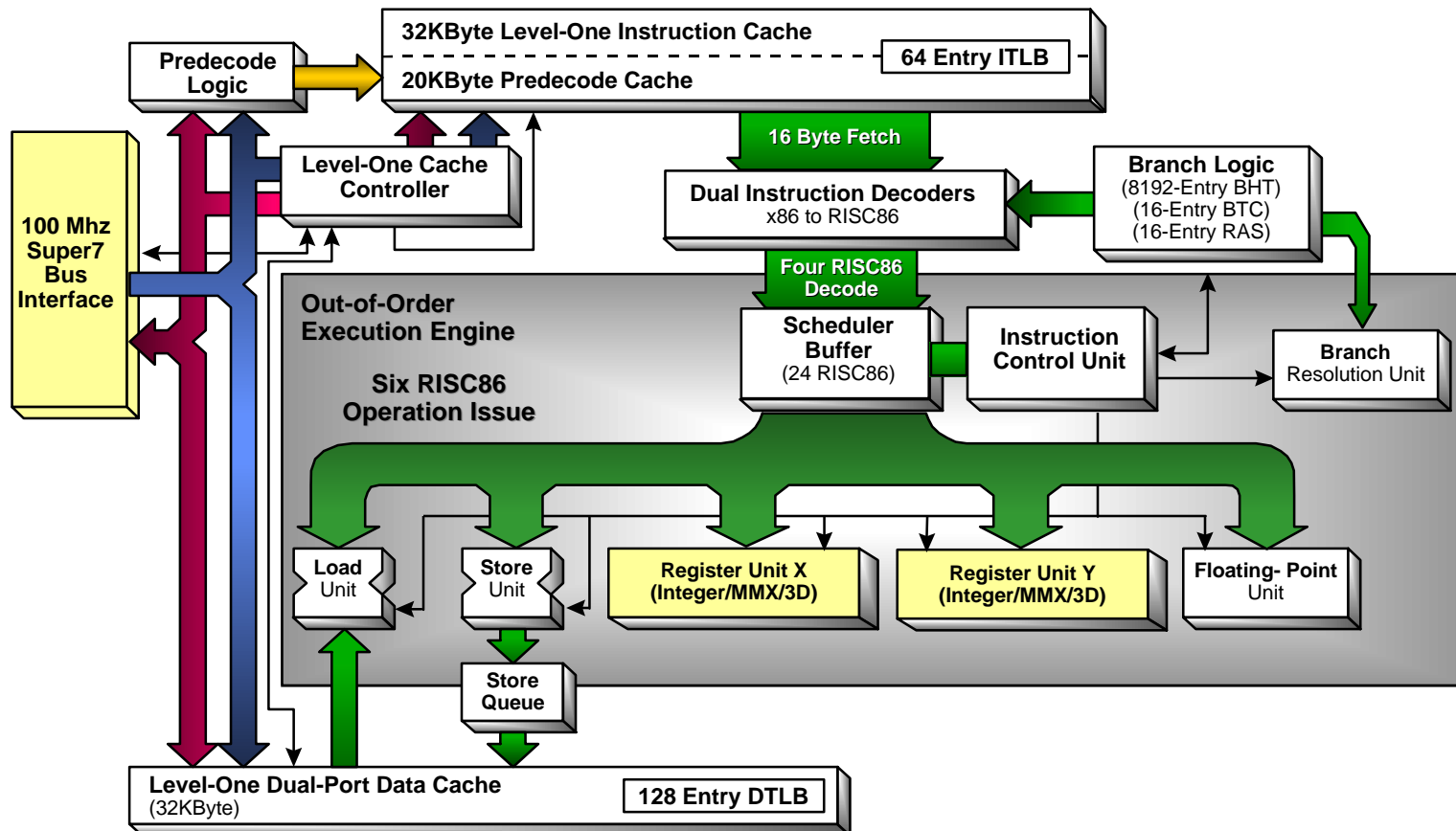


AMD-K6 3D™ New Processor Features



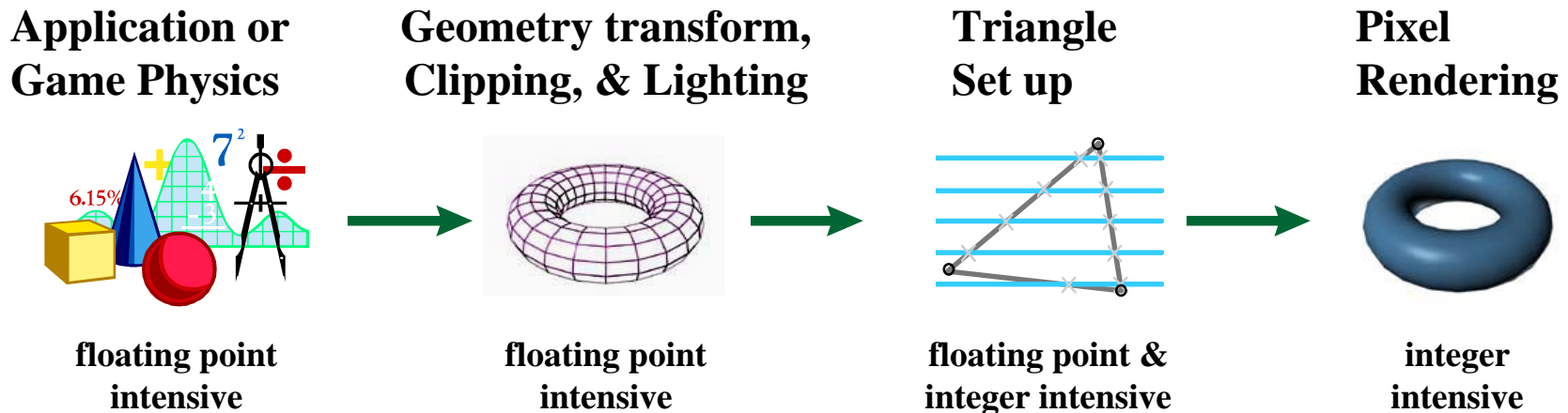
- **AMD-3D™ Technology**
 - Instruction set extensions to accelerate 3D graphics, audio and other multimedia applications
- **Superscalar MMX Units**
 - Dual decode and dual execution pipelines
 - Maintains the K6 advantage of low execution latencies
 - No decode pairing restrictions
 - Only one cycle misalignment penalty on memory accesses
- **100MHz Local Bus**
 - Increases local bus and L2 cache bandwidth by 50%
 - Redesigned I/O timing to allow for low cost 100 MHz motherboard
- **9.3 Million Transistors on a Die of 81mm²**

AMD-K6 3D™ Block Diagram



Acceleration of Multimedia Applications **AMD**

- **Multimedia applications have grown to become an integral part of the PC platform**
 - But multimedia algorithms are very computation intensive



- MMX extensions were added to accelerate integer multimedia algorithms, but the impact on the user experience has been limited since MMX accelerated only some computations.

AMD-3D™ Technology



- **Why a New Technology?**

- Generally only graphics pixel rendering has been accelerated by MMX and 3D graphics hardware; focus has been on integer performance
- 3D graphics performance is now limited by the earlier floating point intensive stages of the graphics processing pipeline
- Realistic physical modeling is also becoming a necessity

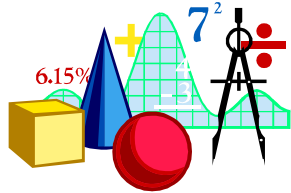
- **What is it?**

- A new set of instructions to greatly accelerate floating point computations
- Multiple floating point operations per clock
- Defined and implemented in collaboration with leading ISV's
- Works in concert with graphics accelerator cards by speeding up the front end of the graphics pipeline

AMD-3D™ Technology

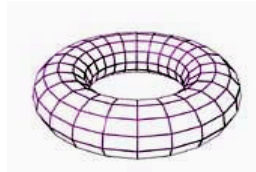


**Application or
Game Physics**



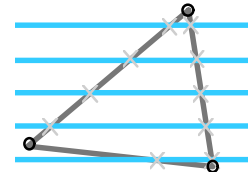
**floating point
intensive**

**Geometry transform,
Clipping, & Lighting**



**floating point
intensive**

**Triangle
Set up**



**floating point &
integer intensive**

**Pixel
Rendering**



**integer
intensive**

AMD-3D Technology Accelerates

Graphic Cards Accelerates

• Benefits

- Relieves the floating point intensive bottlenecks in 3D graphics processing
- Allows for more detailed physics-based modeling and simulations - more objects with accurate physical characteristics displayed at life-like speeds.
- Accelerates most floating point intensive multimedia operations:
 - Graphics pipeline (Physics, Geometry, & Set up)
 - Audio processing (AC-3 and 3D)

AMD-3D™ Technology



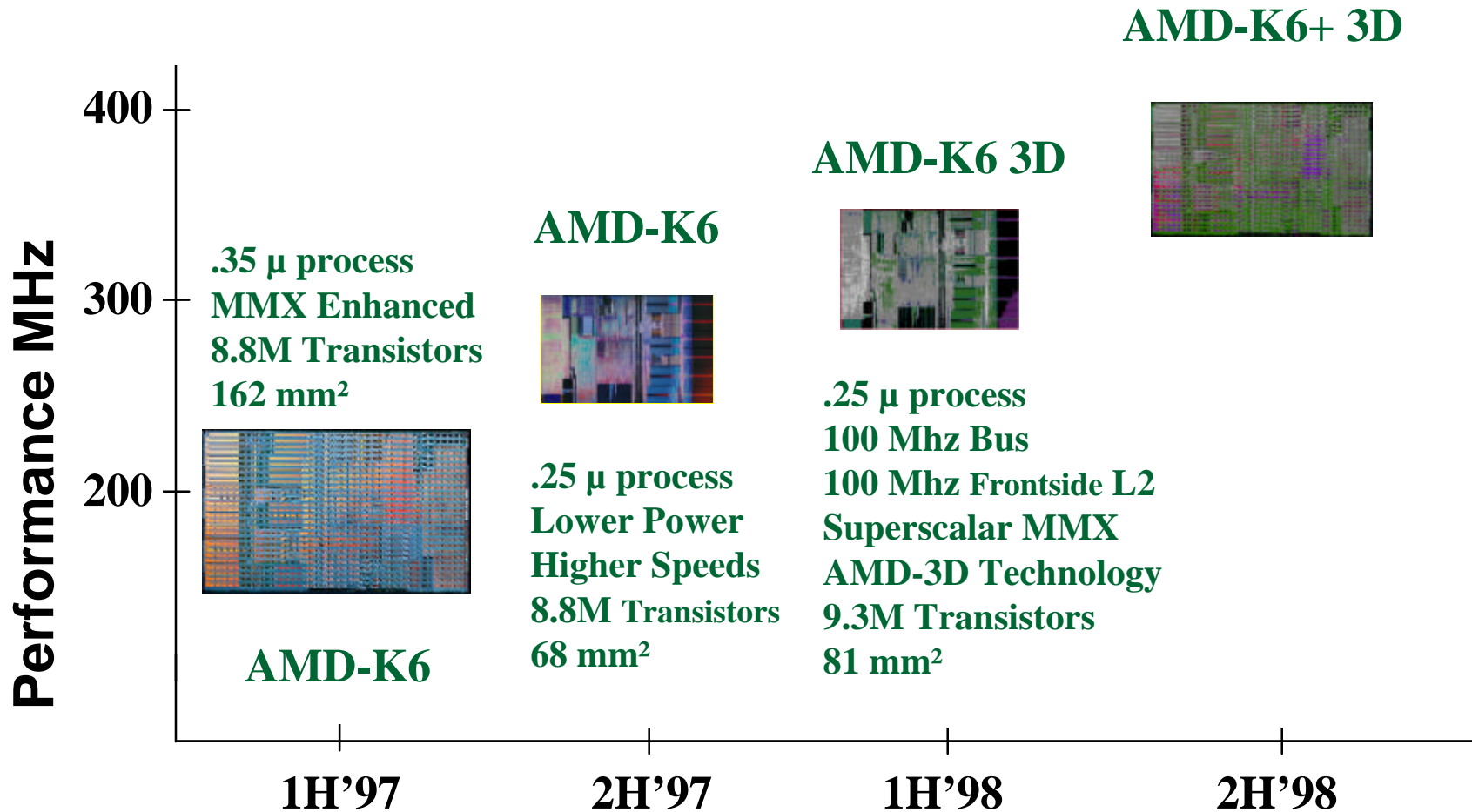
- **SIMD Floating Point Instructions**
 - Supports IEEE Single Precision Data Type
 - Two 32-bit FP values per 64-bit reg/mem operand
 - Uses MMX Registers
- **24 New Instructions**
 - PFMUL, PFADD, PFSUB, PFCMP, PF2I, PI2F, etc.
 - Similar encoding format to MMX Instructions
- **Streamlined for High Performance**
 - Saturating arithmetic
 - No exceptions
 - Limited rounding modes
 - No switching overhead between MMX and AMD-3D instructions
 - Avoids X87 register stack

AMD-3D™ Technology: Software Support



- **Enthusiastic Support from Major ISV's**
- **Full Software Development Support**
 - Full Microsoft Support
 - Assembly language - native Microsoft MASM support
 - Fully optimized API and libraries at introduction: DirectX (Direct3D & DirectSound) and OpenGL
 - Profiler and optimizer tools
 - AMD SDK available to AMD NDA partners
- **Dedicated AMD Development Support Group**
- **No Core OS Support Required**

AMD-K6™ Processor Family Roadmap

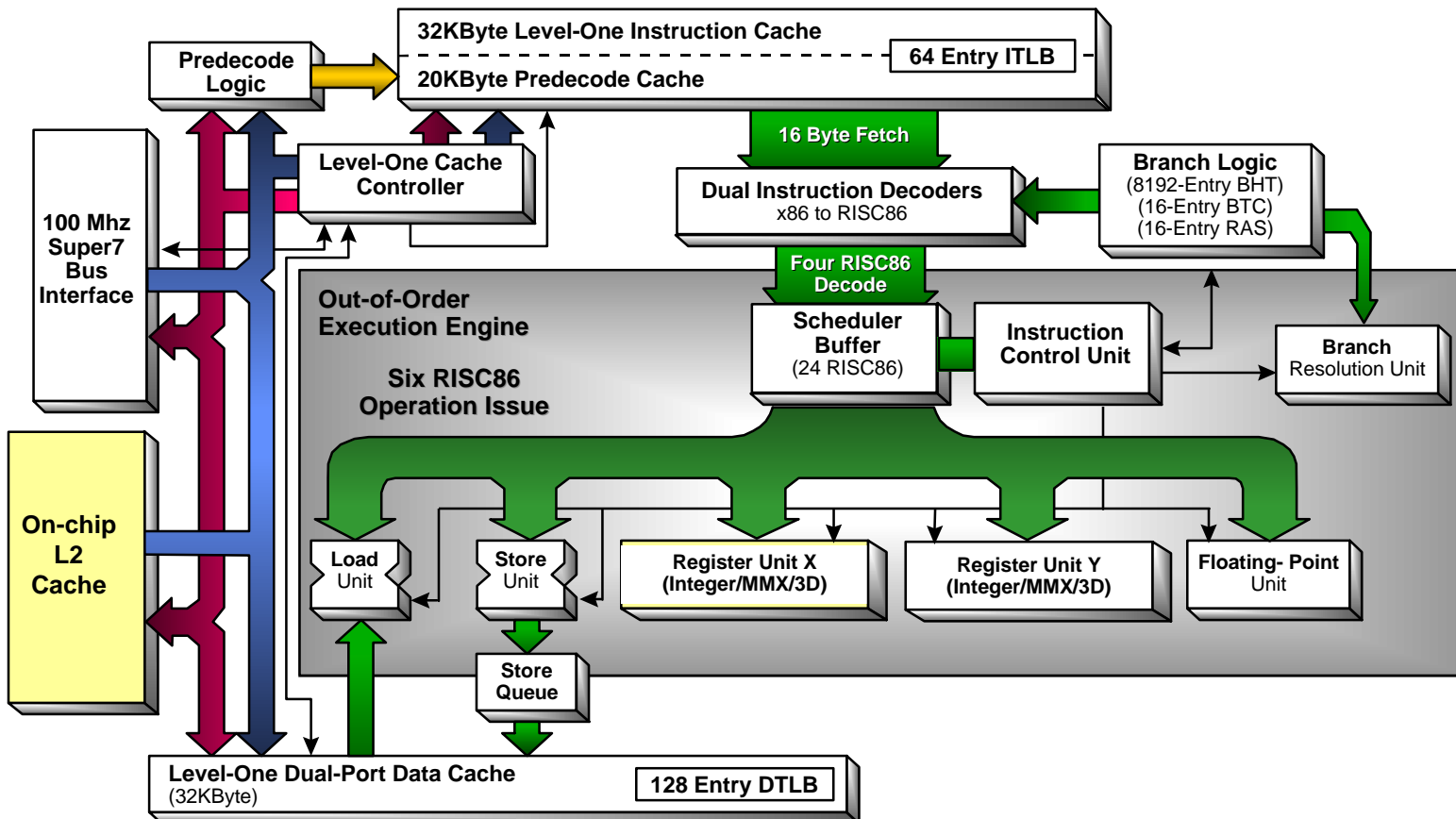


AMD-K6+ 3D Processor Features

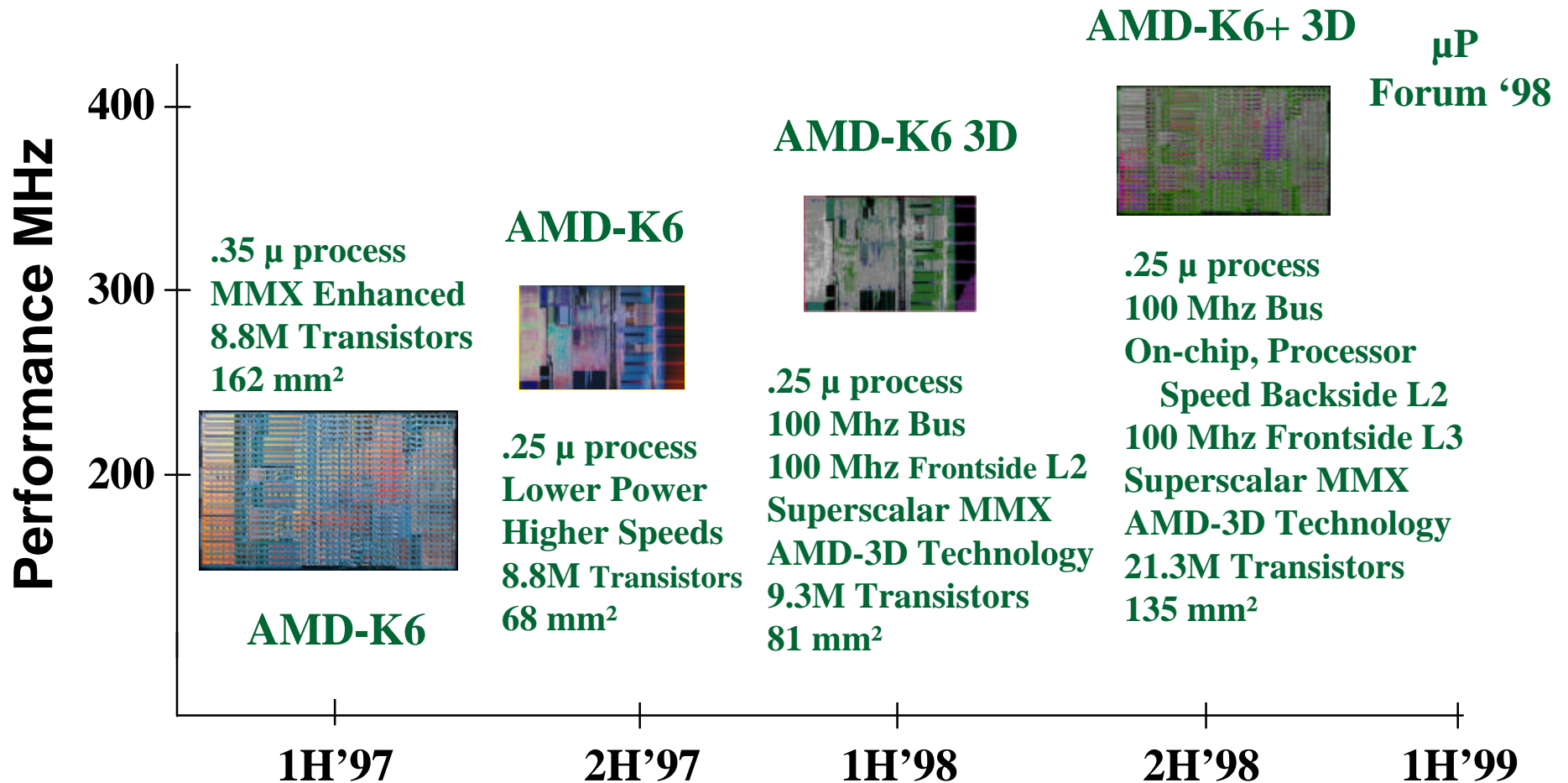


- **On Chip Full-speed Backside Level 2 Cache**
 - Operates at 1X processor frequency
 - 4-1-1-1 (-1-1-1-1) access timing (Peak Bandwidth 3.2 GB/sec at 400 MHz)
 - 256K byte
 - 4-way set associative
 - In addition to current 64 KB L1 cache
- **Improved Write Buffering, Pipelining, and Combining**
- **Large Level 2 TLB - Higher Performance Paging**
- **Maintains Full Socket 7 Compatibility**
 - 100 MHz frontside local bus
 - Optional very large frontside level 3 cache
- **21.3 Million Transistors on a Die of 135 mm²**

AMD-K6+ 3D Block Diagram



AMD-K6™ Processor Family Roadmap



Summary



- **Super7: 100 MHz frontside bus with AGP**
 - Leading edge platform initiative that achieves Socket 7 architectural performance improvements
- **Robust AMD-K6 Product Roadmap for '98**
 - Major CPU architectural performance improvements
 - Higher frequencies
 - 100% compatibility with Socket 7/Super7 infrastructure
 - On-chip level 2 cache
- **AMD-3D™ Technology:**
 - New instruction set of extensions that greatly accelerate 3D graphics, audio and other floating point intensive multimedia algorithms
- **AMD, Enabling a Higher Level of Application Realism**

