SiS Flexible Design Solutions

SiSM661MX/648MX/963

Pentium M Architecture Chipset

Silicon Integrated Systems Corp.
Integrated Product Division
Dec, 2003

Agenda

- SiS roadmap update
- Chipset introduction

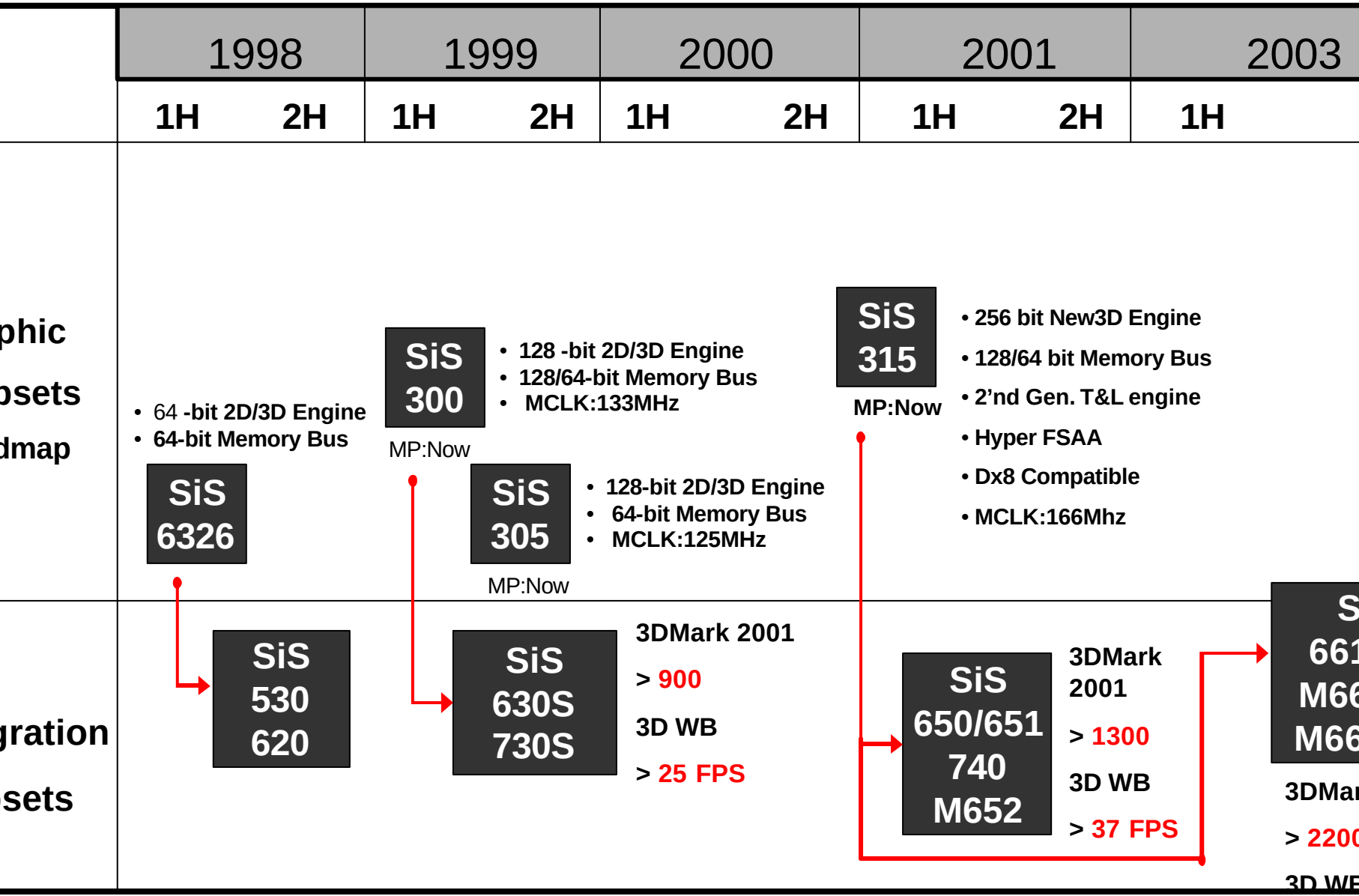
SiS North Bridge Roadmap

Mass Production	Q1'04	Q2'04	Q3'04
Performance	 648MX, Pentium M DDR400, AGP8X MP: Now		
Mainstream	 M661MX, Pentium M DDR400, AGP8X Real256E GPU MP: Now		
Value	 M652, Pentium M DDR333, AGP4X Real256 GPU MP: Now		

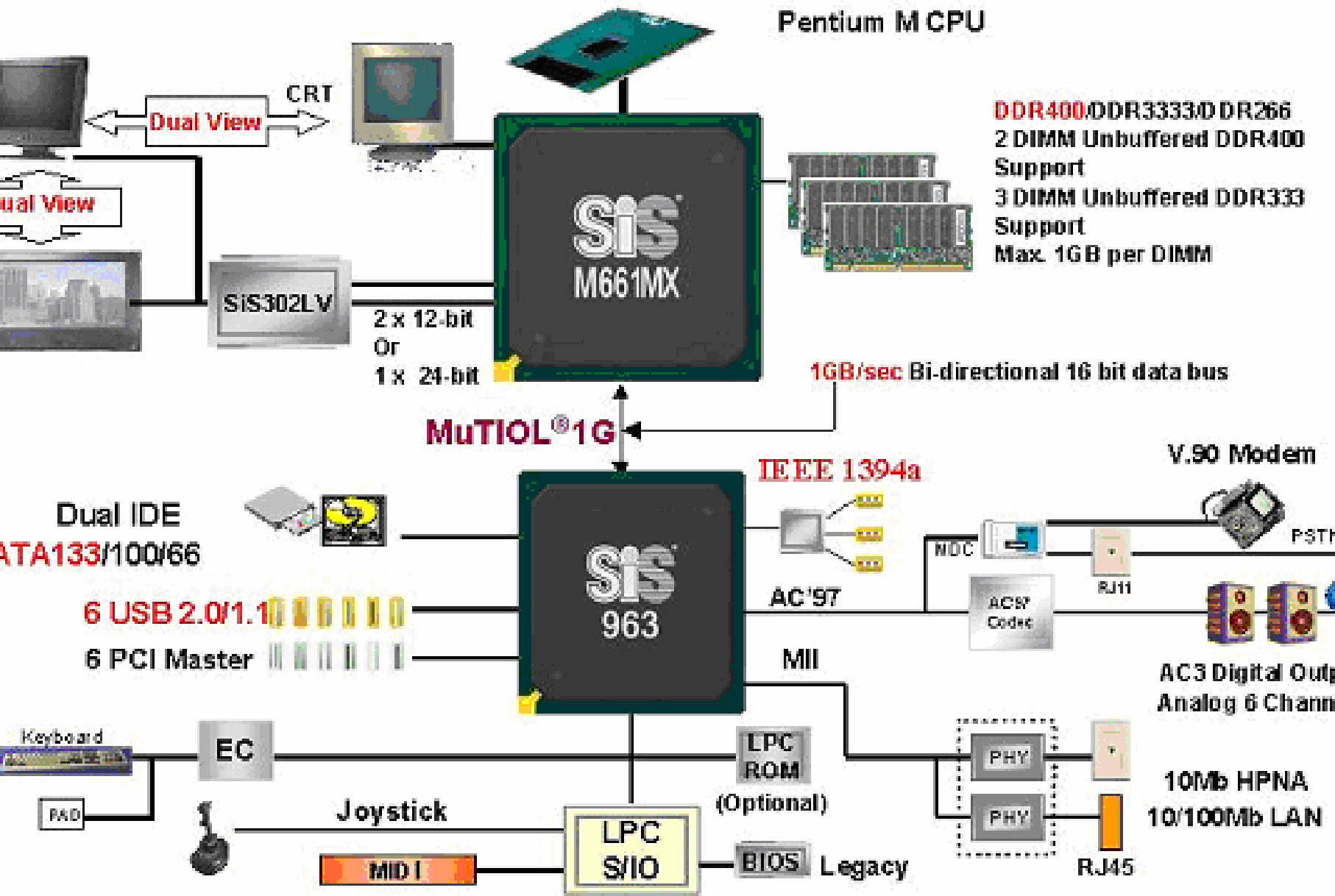
Chipset Introduction

- SiS Integrated Product History
- SiSM661MX/SiS648MX Family w/ SiS963 Block Diagram
- Feature List
- Performance Analysis
- S/W Information
- SiS Technology
- Schedule Information
- Third Party Information

Integration and Graphics Chipset



SiSM661MX/963 System Architecture



SiSM661MX Feature List

Host Interface

- Support Intel Pentium M Hyper Threading CPU
- FSB **533/400MHZ** w/ 2X Address and 4X Data Rate
- 12 Outstanding Transactions support
- Quasi-Synchronous/Asynchronous Host/DRAM Timing support
- Support 2M/4M/8M/16M TSEG SMRAM
- Support Dynamic Bus Inversion.

DRAM Controller

- **DDR400**/DDR333/DDR266 Support
- Support Up to 2 un-buffered DIMMs DDR400
- Support Up to 3 un-buffered DIMMs DDR333/266
- Up to 1GB per DIMM with 512Mb tech.
- Dynamic Clock Enable (CKE) control placing the Memory into Suspend to DRAM state.

AGP3.5 and AGP2.0 Compliant

- 8X/4X Mode Support
- Fast Write Support
- Support 1.5V interface only

SiS MuTIOL Technology Delivering 1GB/sec Bandwidth

SiSM661MX VGA Key Feature

DX9 S/W Compliant

High performance 256Bit 3D/128Bit 2D Graphic Engine

- 2 pixel rendering pipelines and 4 texture units per cycle (2P4T)
- Up to **200 MHz** ECLK

SiS Ultra-AGPII™ Technology w/ up to 3.2GB/s Data Transfer Rate

- Successor of Ultra-AGPII™ Technology and double the bandwidth up to 3.2GB/s w DDR400
- AGP8X equivalent bandwidth for 3D/2D/Video

Advanced Hardware Acceleration for DVD playback

Share Memory Size 32MB and 64MB

Dual 12-bit DDR Digital Interface for Digital LCD/TV-OUT support

- NTSC/PAL TV-OUT
- DVI LCD Monitor
- Dual view function support for LCD-TV,LCD-CRT or CRT-TV

Built-in high performance 333MHz RAMDAC

Graphic support mode

- CRT highest resolution mode: 2048x1536x32@75NI
- LCD highest resolution mode: 1600x1200x32@ 60NI

SiS963 MuTIOL® Media IO

USB 2.0/1.1 Support

– Integrated Two Independent Open HCI Controllers includes Root Hub w/ two USB 1
ports each
– Integrated One EHCI Controller includes Root Hub w/ six USB 2.0 ports
– Support a maximum of 6 USB Ports. Dynamic connection to USB 1.1 or USB 2.0.

IDE Controller

– Dual Independent IDE Channels with **ATA133**/100/66 support

Integrated MAC Controller with Standard MII Interface

Integrated Audio Controller w/ AC97 2.2 Compliance Interface

– Support **5.1 channel of Audio output** and V.90 HSP Modem
– Support 4 Separate SDATAIN Pins for 3 x 2 ch Audio Codec + 1 Modem Codec

3 ports IEEE 1394a

PCI 2.2 Compliant

– Support up to 6 PCI Masters

LPC Interface 1.0 Compliance

ACPI 1.0b Compliance

I/O APIC Support

PC2001 Compliance

SiS MuTIOL Technology Delivering 1GB/sec Bandwidth

SiS963 Power Management

Support Intel CPU Speed Step Technology

Advanced Power Management ACPI 1.0b Compliance

Sleeping States

– S0: Normal Run
– S1: Internal CPU Clock Stop
– S3: Suspend-To-DRAM
– S4 : Suspend-To-HDD
– S5: System Power Off

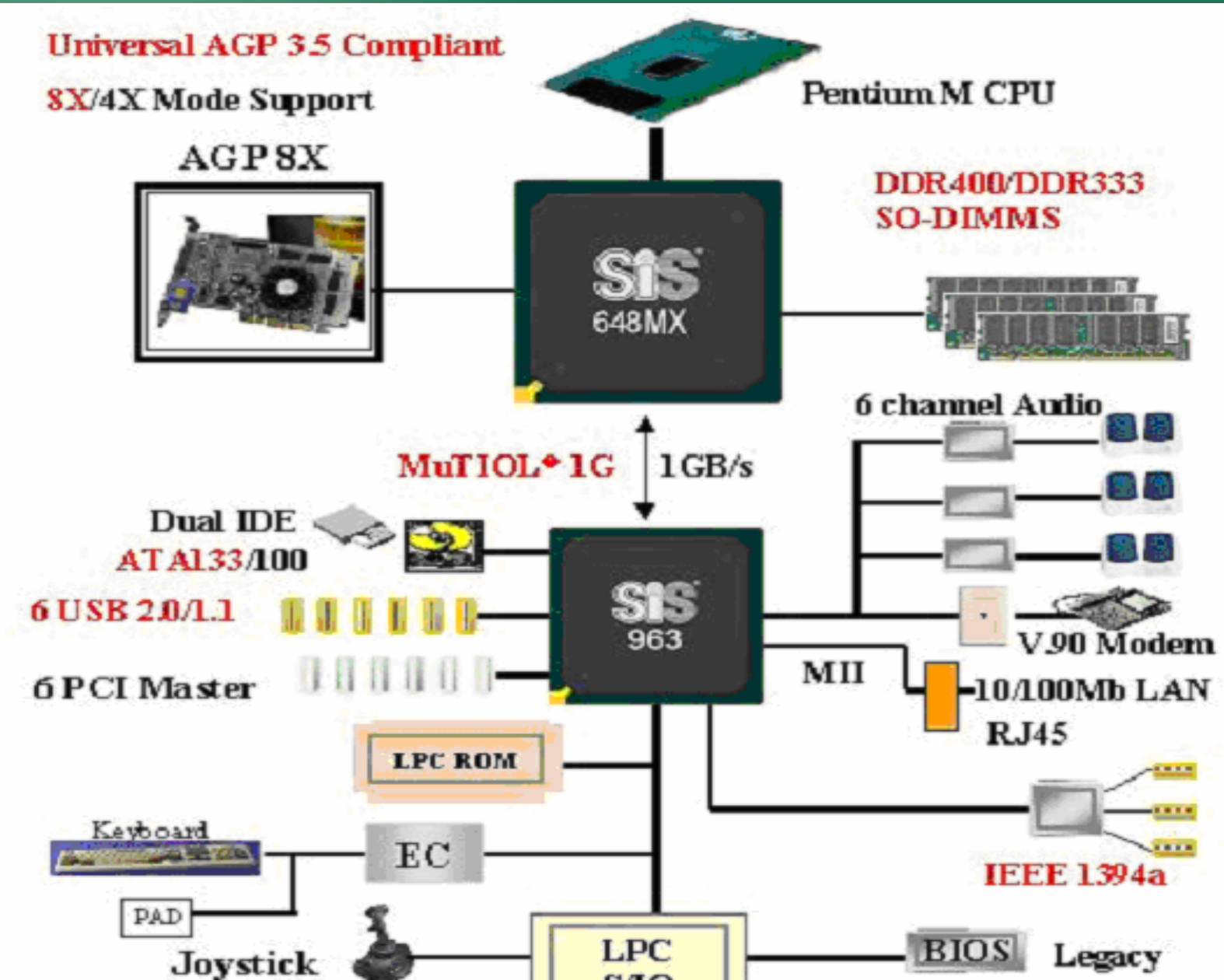
Processor Power States

– C0, C1, C2, C3, C4

Wake up Events

– Power Button
– USB Keyboard/Mouse/Devices
– Ring In
– PME#
– RTC Alarm
– MAC
– Audio

SiS648MX/963 System Architecture



M661MX/648MX/M652 Feature Comparison

	M661MX	*648MX*	*M652*
South Bridge	963	963	962
FSB	533/400	533/400	533/400
DRAM	DDR400	DDR400	DDR333
AGP	8X/3.5	8X/3.5	4X/3.0
Gfx	Real256E	No	Real256
DirectX	DX9 SW compliant	NA	DX7

PS: M661MX/648MX are Pin Compatible

SiS Technology Advantage

- SiS HyperStreaming Technology
- SiS Ultra-AGPII TM Advantage

SiS HyperStreaming Technology

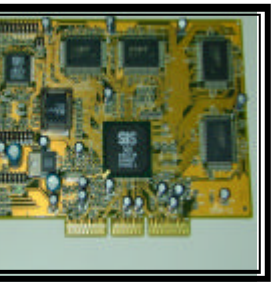
- HyperStreaming Architecture
- Performance Advantages

What is HyperStreaming Technology?

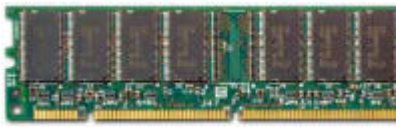
- **"HyperStreaming"** Makes Streams of Data Flow All Over the Paths with More
  - ✓ **Efficiently**
  - ✓ **Concurrently**
  - ✓ **Smoothly**
  - ✓ **Intelligently**
- **Optimizing System for**
  - **"Low Latency" with Single Stream**
  - **"Pipelining" and "Concurrent Execution" with Multiple Stream**
  - **"Prioritized Channel" with Specific Stream**
  - **"Smart Flow Control" and "Intelligent Arbitration" with Smart Stream**

HyperStreaming Architecture (I)

FSB800 HyperThreading
6.4 GB/s



AGP8X
2 GB



DDR400/DDR333
(PC3200/PC2700)

Smart Arbitration
Split Transaction
Pipelining
Concurrent Exec.
MuTIOL® 1G
NB

1GB/s

MuTIOL® 1G
SB

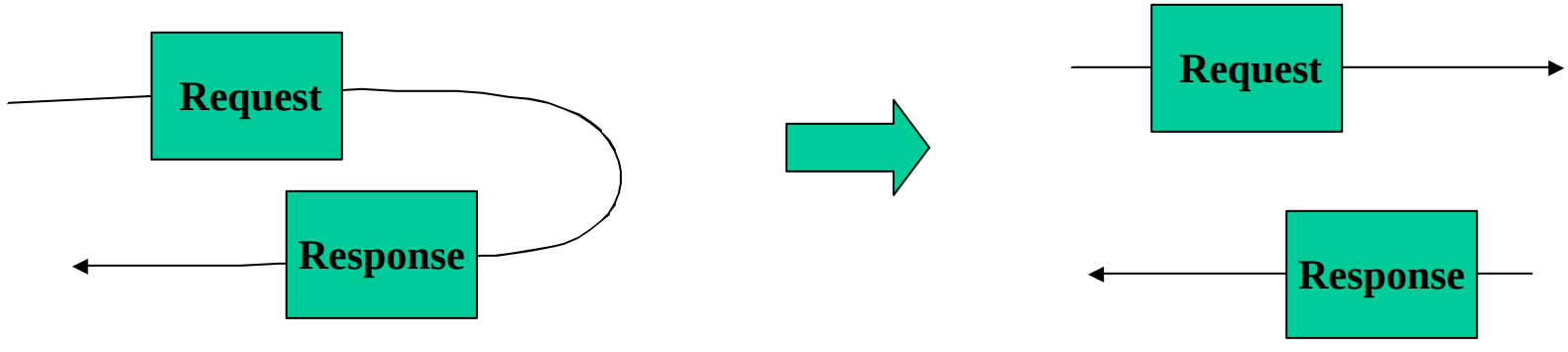
1.2GB/s

Audio USB2 MAC ATA133 ....

HyperStreaming Architecture

HyperStreaming Links Fast Together

Split Transaction:



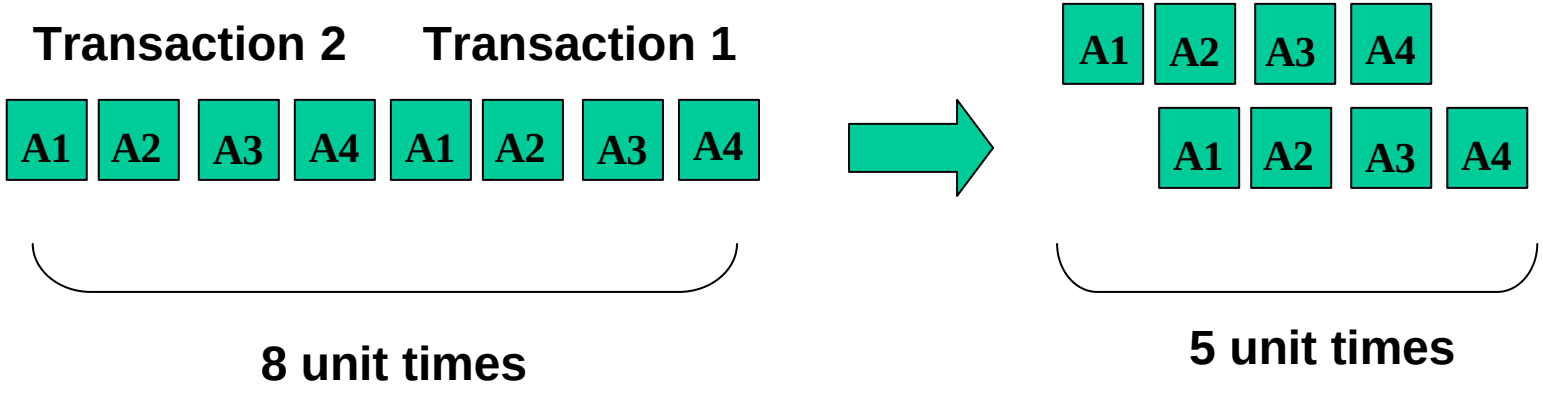
Bus occupied until “Response” is returned. Bus can not be released until the request and response phase completed.

Bus released after “Request” phase and Bus can be used by next transaction (either request or response), then be occupied while the response is return. The Bus utilization is better.

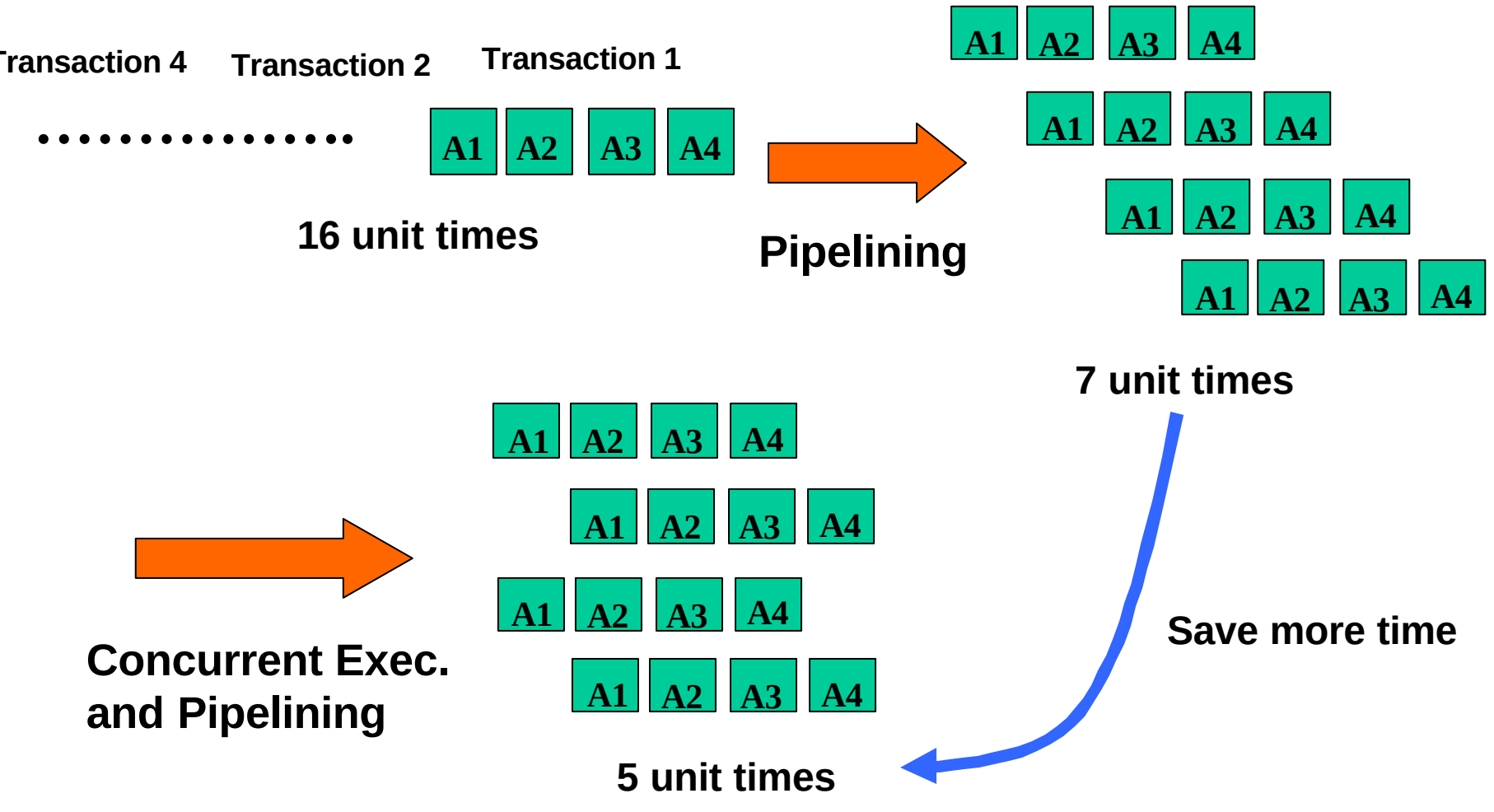
Pipelining Transaction:

Transaction in four steps:

- A1 Instruction Fetch
- A2 Instruction Decode
- A3 Fetch Data
- A4 Execution



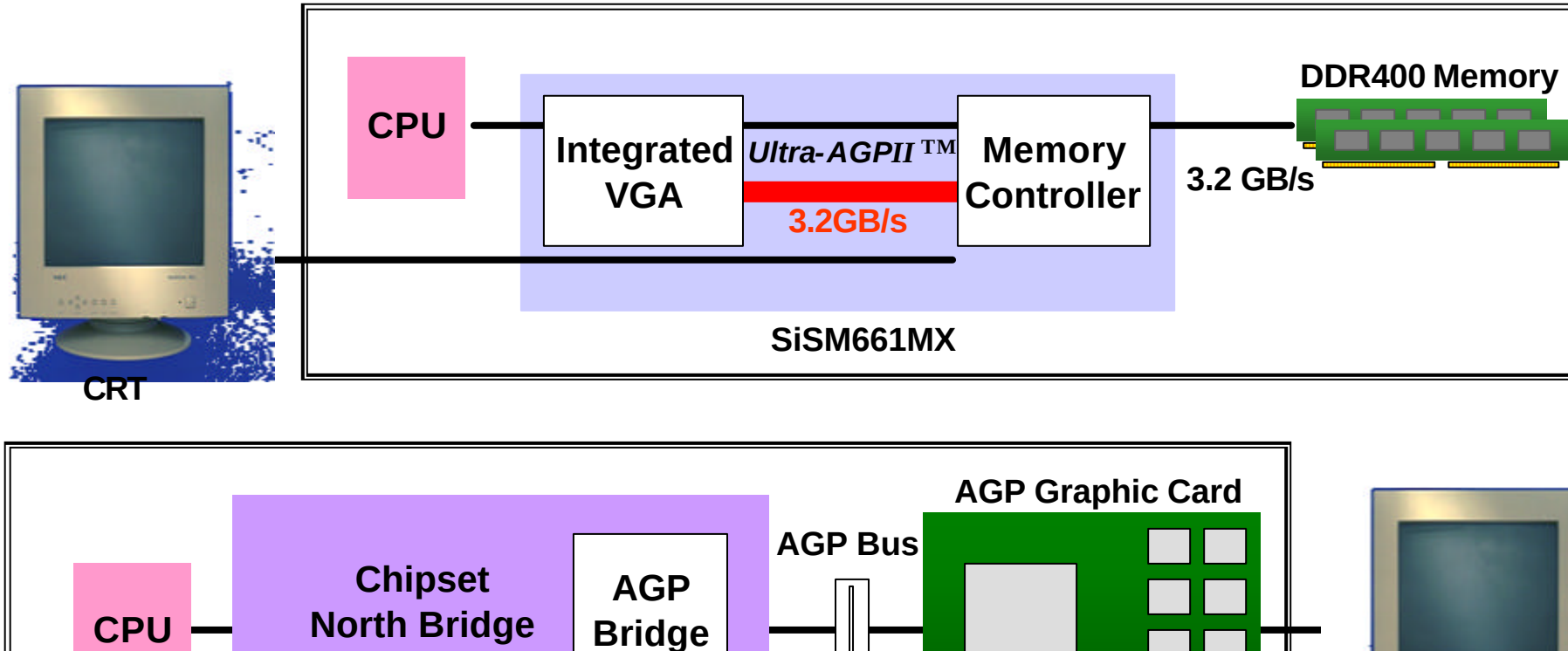
Concurrent Exec. and Pipelining Transaction:



SiS Ultra-AGPII TM Advantage

- High Bandwidth @ 3.2GB/s > AGP 8X @ 2.1 GB/s
- Shorter Data Transfer Path vs. External AGP Path
- Bus Cycle Advance Pipeline vs. Pipeline

M661MX Ultra-AGPII ™ Advantage



Software Information

Driver Support from SiS

- **SiS Unified VGA Driver**
  - Backward compatible w/M650/651/650/740 family
  - Support Win98SE,WinME,Win2000 and WinXP
- **SiS Unified AGP Driver**
  - Backward compatible w/648/650/645/735/635/730/630 family
- **SiS7012 Unified Audio Driver**
  - Backward compatible w/962/961/735/635 Family
- **SiS Unified LAN Driver**
  - Backward compatible w/962/961/735/635/730/630 family
- **SiS Unified IDE Driver for ATA133**
  - Backward compatible w/962/961 family

Software Support -- USB2.0

❖ USB2.0

- WinXP SP1 and later one in-box USB2 driver support SiS USB2
- Win2000 and WinXP USB2 logo driver v1.00 released
- Win98SE and WinME USB2 driver supported from the third party.

Product Schedule

North Bridge- M661MX:

Sample :	NOW
Mass Production :	NOW

North Bridge- 648MX:

Sample :	NOW
Mass Production :	NOW

North Bridge- M652:

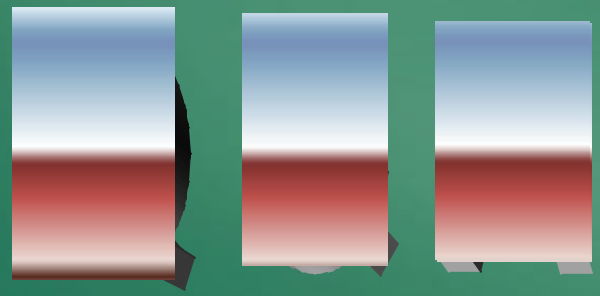
Sample :	NOW
Mass Production :	NOW

South Bridge- 963:

Sample :	NOW
Mass Production :	NOW

Third Party Information

SiSM661MX/648MX Clock Chip Solution



❖Thank You !!