SiS Newest AMD K7 Solution

~ With FSB400 and DDR400 ~

Silicon Integrated Systems Corp.
Integrated Product Division
Technical Marketing Dept.
Mar. 2003
Agenda

- SiS K7 Product Positioning
- System Summary
- Leading Technology
- Performance Comparison
- Product Status and Driver Support
AMD Products Positioning

Full Product Lines for Value PC, Mainstream PC, and Performance PC!!

- Athlon™ XP 333
  - DDR400, AGP 8x

- Athlon™ XP 266
  - DDR333, AGP 8x

- Athlon™ XP 266
  - DDR266, AGP4x
  - Single Chip
  - IEEE 1394A

- Athlon™ XP 266
  - DDR266, AGP4x
  - Single Chip

- Athlon™ XP 333
  - DDR400, AGP 8x
  - Ultra256 VGA
  - Pin Compatible w/ 755

- Athlon™ XP 400
  - DDR400, AGP 8x
  - Pin Compatible w/ 746FX

- Athlon™ 64 800
  - AGP 8x

- Athlon™ 64 800
  - AGP 8x
  - Ultra256 VGA
  - Pin Compatible w/ 755

- Athlon™ XP 333
  - DDR400, AGP 8x
  - Real256E VGA

MP, now Q1’03 Q2’03 Q3’03
System Summary

- System Architecture
- North Bridge Summary
- South Bridge Summary
SiS748/963L System Diagram

AMD Athlon™ XP/Duron CPUs
FSB 400/333/266MHz

AGP 8X/4X Interface

DDR400/DDR333/DDR266
3 DIMMs Unbuffered DDR
Max. 1GB per DIMM

DDR400/DDR333/DDR266

MuTIOL® 1G

AC97

6 channel speaker

AC'97 Codec

1/10Mb HPNA

V.90 Modem

1/10Mb HPNA
or

10/100Mb LAN

-- PC2001 Compliant --
SiS748 North Bridge Summary

- **400MHz Front Side Bus**
- **Support DDR400/333/266 DDR SDRAM**
- **Support AGP 8X/4X interface**
- **MuTIOL® 1G Interface**
  - 1GB/s Bandwidth
  - Bi-Directional 16-bit Data Bus
SiS963L South Bridge Summary

- Support ATA133/100/66/33
- USB2.0 for up to 6 ports
- 6 channels of AC97 speaker outputs
- Support V.90 HSP Modem
- ACPI 1.0b Compliance
- MuTIOL® 1G Interface
  - 1GB/s Bandwidth
  - Bi-Directional 16-bit Data Bus
Leading Technology

- MuTIOL® 1G Technology
- HyperStreaming Architecture
  - SerialATA-SiS180
**MuTIOL® Technology**

MuTIOL® 1G Delivering 1GB/s Bandwidth

Bi-Directional 16-bit Data Bus at 533MHz Operating Frequency

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**MuTIOL® Media I/O Family – Comparison Chart**

<table>
<thead>
<tr>
<th>South Bridge</th>
<th>961</th>
<th>961B</th>
<th>962</th>
<th>963</th>
<th>963L</th>
</tr>
</thead>
<tbody>
<tr>
<td>MuTIOL®</td>
<td>533MB/s</td>
<td>533MB/s</td>
<td>533MB/s</td>
<td>1GB/s</td>
<td>1GB/s</td>
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<tr>
<td>ATA 133</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>USB 2.0</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>1394a</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
MuTIOL® 1G Technology

---Sufficient Bandwidth for All DMA Master Devices Concurrent Accessing

AGP 8X Controller <-> Memory Controller

MuTIOL Packet Layer

MuTIOL Channels Layer

USB2.0: 480Mb/s
Dual IDE: 133x2MB/s
USB1.1: 3x12MB/s
MAC: 12MB/s
AC97 Audio/Modem: 2MB/s
P1394: 400 Mb/s
PCI Controller: 133MB/s
LPC DMA Controller

PCI Master x6

K7: 3.2 GB/s
K8: 6.4 GB/s
P4: 4.3 GB/s

2.7 or 3.2 GB/s

SiS963 MuTIOL®1G

1GB/s
MuTIOL® 1G Technology Advantage

--Sufficient Bandwidth for connecting Northbridge and Southbridge

Device Layer: 1.2 GB

Bottleneck

266MB/s @ 33Mhz

>527 MB/s

533MB/s @ 66Mhz

SiS963L
SiS MuTIOL® 1G

2MB/s
AC97

12MB/s
MAC

400 Mb/s
P1394

480 Mb/s
USB 2.0

3x12 Mb/s
USB 1.1

133 MB/s
PCI

2X133 MB/s
ATA133

Ixx

Vxx
What is HyperStreaming Technology?

- “HyperStreaming” is SiS Proprietary technology
  - Make streams of data flow all over the paths
    - Efficiently
    - Concurrently
    - Smoothly
    - Intelligently

- Optimized system for
  - “Low Latency” with Single stream
  - “Pipelining” and “Concurrent Execution” with Multiple streams
  - “Prioritized Channel” with Specific stream
  - “Smart flow control” and “Intelligent arbitration” with Smart stream

- Satisfying End Users Desire
Best Architecture-- SiS HyperStreaming

• **Parallel architecture in full path**
  – North-Bridge
  – Link between North-Bridge and South-Bridge
  – Device controllers
  – Host Interface
  – Memory Interface

• **Lower system latency**

• **Parallel and cost effective channels**

• **Isochronous channel for higher priority data**

• **Intelligent interface control for efficiency**

*Detail information please refer to [www.sis.com](http://www.sis.com)*
SerialATA – SiS180

-- Single Chip
-- For Powerful IDE Devices Configuration
SiS180 + SiS963L IDE Configuration

• Compatibility Mode
  – IRQ14 for primary channel and IRQ15 for secondary channel
  – Maximum 4 IDE devices
  – Fix I/O port and IRQ
  – Resource Conflict @ over 4 IDE devices connected

• Native Mode
  – Native mode support in new OS only (WindowsXP, Windows.Net Server)
  – I/O port and IRQ assigned by BIOS or OS
  – No limitation of “Maximum 4 IDE devices Support”
SiS180 + SiS963L IDE Configuration -cont.

Compatibility Mode

With Win98/WinMe Default IDE driver installed

Option 1: Disable 2 PATA Controller in 963L and use 2S1P in 180 (Max. 4 devices)

Option 2: Disable 2S1P controller in 180 and use 2 PATA controller in 963L (Max. 4 devices)
SiS180 + SiS963L IDE Configuration -cont.

Native Mode

- With Native mode support OS
  Both 2 PATA controllers in 963L and 2S1P controllers in 180 can be enabled

- Native mode support OS is WindowsXP and Windows.Net Server

- Maximum Support 8 IDE devices
SiS180 Software RAID Support

• RAID0, RAID1, RAID0+1, and JBOD

• GUI Utility to create RAID, delete RAID, show RAID configuration.

• Support OS: WindowsXP and Windows2000
SiS180 Software RAID Support

RAID 0 (Striping):

- RAID 0 implements a striped disk array, the data is divided into small blocks and each block is written to a separate disk drive.

- I/O performance is improved by separate the I/O access via different channels and drives.

- Requires a minimum of 2 drives to implement
RAID 1 (Mirror):

- RAID 1 implements a mirrored disk array, the data is written to one disk and copied to the replacement disk at the same time.

- Data will be backup in the replacement disk, that means, no rebuild is necessary in case of disk failure. While disk failure, just restore from the replacement disk.

- Requires a minimum of 2 drives to implement
SiS180 Software RAID Support

RAID 0+1:

- RAID 0+1 implements a mirrored disk array, which element is a striped array. The data is written in the format of striping and copied to the replacement disk array at the same time.
- Providing the same level of rebuild capability of RAID1
- Requires a minimum of 4 drives to implement
SiS180 Software RAID Support

**JBOD:**

- JBOD combines two or more physical Disk to be single virtual Disk.
- Requires a minimum of 2 drives to implement.
SiS180 Key Feature List

• **PCI Interface**
  – PCI rev 2.3 Compliant
  – Support 33MHz/32bit PCI interface

• **Serial ATA Interface**
  – Support Serial ATA rev 1.0
  – Support Serial ATA spec. of 150MB/s transfer rate
  – Integrated 2 channel SATA PHY logic with 2 independent Serial ATA ports support

• **Parallel IDE Interface**
  – One IDE Channel with 2 IDE devices support
  – Support PIO mode 0, 1, 2, 3, 4 and Multiword DMA mode 0, 1, 2
  – Support Ultra DMA mode 33/66/100/133
  – ATA/ATAPI 48-bit address compliance for supporting device over 137GB
  – Support Native and compatibility Mode

• **ROM Interface**
  – Support 64K bytes ROM

• **Package**
  – 128-pin PQFP Package
Performance Comparison

- SiS748 vs. KT400A Feature list
- Performance Comparison
  SiS748 vs. KT400A
  SiS748 DDR480 vs. DDR400
## SiS748 VS KT400A

### ~ Feature List ~

<table>
<thead>
<tr>
<th></th>
<th>Front Side Bus</th>
<th>400MHz</th>
</tr>
</thead>
<tbody>
<tr>
<td>Memory Type</td>
<td>DDR400/333/266</td>
<td>333MHz</td>
</tr>
<tr>
<td>AGP</td>
<td>8X</td>
<td>8X</td>
</tr>
<tr>
<td>North/South Bridge Bandwidth</td>
<td>1GB/s</td>
<td>533MB/s</td>
</tr>
<tr>
<td>PCI Device/ Slot</td>
<td>6 PCI</td>
<td>6 PCI</td>
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<tr>
<td>IDE</td>
<td>ATA 33/66/100/133</td>
<td>ATA 33/66/100/133</td>
</tr>
<tr>
<td>USB</td>
<td>USB 1.1/2.0 6 ports</td>
<td>USB 1.1/2.0 6 ports</td>
</tr>
</tbody>
</table>
SiS748 VS KT400A

3D Performance
~ Specview 7.0 ~

SiS748
CPU: AMD Athlon XP 2200+
DRAM: Kingston DDR400 256MB
VGA Driver: ATi9700 6.13.10.6218
HD: Maxtor Maxtor 40G 7200 ATA133

KT400A
CPU: AMD Athlon XP 2200+
DRAM: Kingston DDR400 256MB
VGA Driver: ATi9700 6.13.10.6218
HD: Maxtor 40G 7200 ATA133
SiS748 VS KT400A

3D Performance

~ Quake 3 ~

640x480x32bit

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DRAM: Kingston DDR400 256MB
VGA Driver: ATI9700 6.13.10.6218
HD: Maxtor 40G 7200 ATA133

1024x768x32bit
SiS748 VS KT400A
System Performance
~ Winstone ~

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SiS748 VS KT400A
System Performance
~ PC Mark2002 ~

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The Miracle of **DDR480** Overclocking  
-SiS748  
**DRAM Performance**  
~Sandra 2003~

- **Int ALU/RAM Bandwidth**
  - 200/200: 2670
  - 200/240: 2747
  - **Increase: +2.88%**

- **Float IPU/RAM Bandwidth**
  - 200/200: 2497
  - 200/240: 2585
  - **Increase: +3.52%**

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**SiS748**  
**CPU:** AMD Athlon XP 2200+  
**DRAM:** Hynix DDR400 512MB CL3T  
**VGA Driver:** ATi9700 6.13.10.6218  
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The Miracle of DDR480 Overclocking
-SiS748

3D Performance
~3DMARK2001SE~

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The Miracle of **DDR480 Overclocking**

-SiS748-

**3D Performance**

~ Quake 3~

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VGA Driver: ATi9700 6.13.10.6218
HD: Maxtor Maxtor 40G 7200 ATA133

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**800x600x32bit**

- 200/240: 252.2
- 200/200: 271.1

**1280x1024x32bit**

- 200/240: 232.8
- 200/200: 250

+6.98%  
+6.83%
The Miracle of **DDR480** Overclocking
- SiS748

System Performance
~Winstone~

Ccws2002

<table>
<thead>
<tr>
<th>Memory Setting</th>
<th>Ccws2002 Score</th>
<th>Improvement</th>
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</thead>
<tbody>
<tr>
<td>200/200</td>
<td>43.2</td>
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<tr>
<td>200/240</td>
<td>46.1</td>
<td>+6.71%</td>
</tr>
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</table>

**SiS748**

- **CPU:** AMD Athlon XP 2200+
- **DRAM:** Hynix DDR400 512MB CL3T
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The Miracle of DDR480 Overclocking
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System Performance
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Product Status and Driver Support
# Product Status

<table>
<thead>
<tr>
<th>Product</th>
<th>Sample</th>
<th>Mass Production</th>
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</thead>
<tbody>
<tr>
<td>North Bridge- 748:</td>
<td>Now</td>
<td>Apr.</td>
</tr>
<tr>
<td>South Bridge- 963L:</td>
<td>Sample A0:</td>
<td>Now</td>
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<tr>
<td></td>
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<td>Mass Production</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Now</td>
</tr>
</tbody>
</table>
Software Support

• **SiS Unified VGA Driver**
  - Backward compatible w/650/651/M650/740 family
  - Support Win98SE, WinME, Win2000 and WinXP

• **SiS Unified AGP Driver**
  - Backward compatible w/630/730/635/735/645/650/648 family

• **SiS7012 Unified Audio Driver**
  - Backward compatible w/635/735/961/962 Family

• **SiS Unified LAN/HomePNA Driver**
  - Backward compatible w/630/730/635/735/961/962 family

• **SiS Unified IDE Driver for ATA133**
  - Backward compatible w/961/962 family

• **SiS180 RAID/Utility/IDE Driver**
  - v2.02 logo’d driver released
  - Backward compatible w/ 961/962/963 family
Thank You!

More details products’ information, please visit SiS website at www.sis.com