SiS Newest AMD K7 Solution
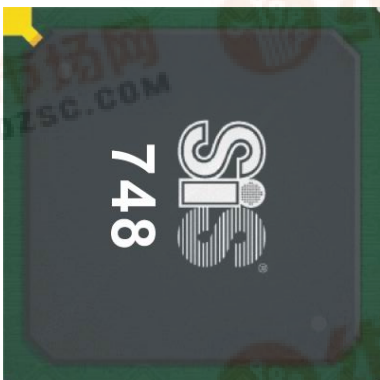
~ With FSB400 and DDR400 ~

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!!

Value	Mainstream	Performance

MP, now

SiS 740
- Athlon™ XP 266
- DDR266
- Real256 VGA

SiS 735
- Athlon™ XP 266
- DDR266, AGP4x
- Single Chip

SiS 745
- Athlon™ XP 266
- DDR333, AGP4x
- Single Chip
- IEEE 1394A

SiS 746
- Athlon™ XP 266
- DDR333, AGP8x

SiS 746 FX
- Athlon™ XP 333
- DDR400, AGP8x

Q1'03

SiS 755
- Athlon™ 64 800
- AGP8x
- Pin Compatible w/ 760
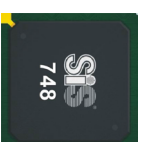
SiS 748
- Athlon™ XP 400
- DDR400, AGP8x
- Pin Compatible w/ 746FX

Q2'03

SiS 760
- Athlon™ 64 800
- AGP8x
- Ultra256 VGA
- Pin Compatible w/ 755

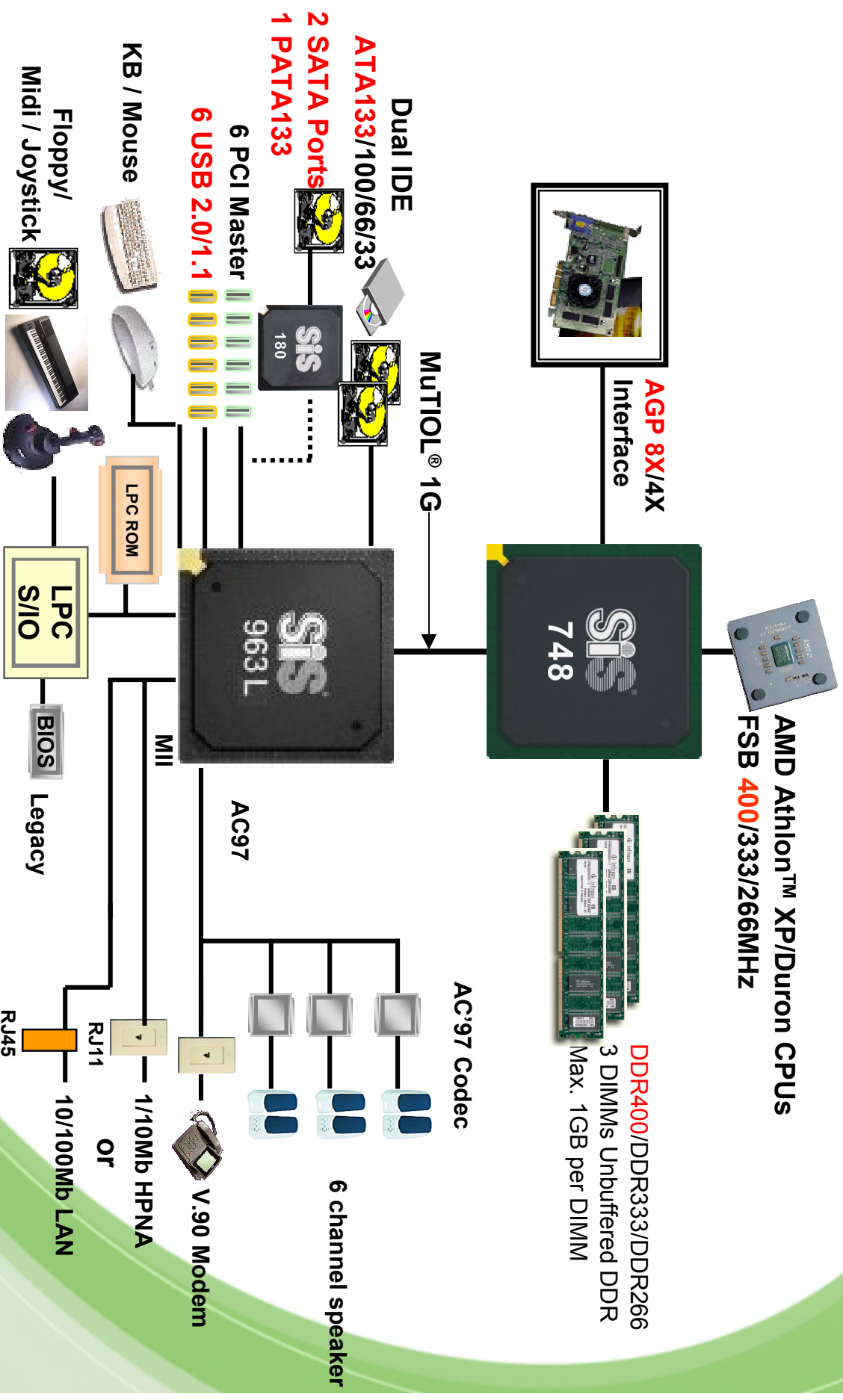**Q3'03**

SiS 741
- Athlon™ XP 333
- DDR400, AGP8x
- Real256E VGA

System Summary

- System Architecture
- North Bridge Summary
- South Bridge Summary

SiS748/963L System Diagram

-- PC2001 Compliant --

AGP 8X/4X
Interface

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

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

748

963L

MuTIOL® 1G

Dual IDE
ATA133/100/66/33
2 SATA Ports
1 PATA133

6 PCI Master

6 USB 2.0/1.1

KB / Mouse

Floppy/
Midi / Joystick

LPC ROM

LPC
S/IO

BIOS Legacy

MII

AC97

AC'97 Codec

6 channel speaker

V.90 Modem

1/10Mb HPNA
or
10/100Mb LAN

RJ45

RJ11

180

SiS748 North Bridge Summary

SiS748 North Bridge Architecture

Host Interface

AGP Interface

Memory Controller

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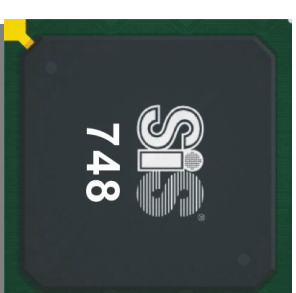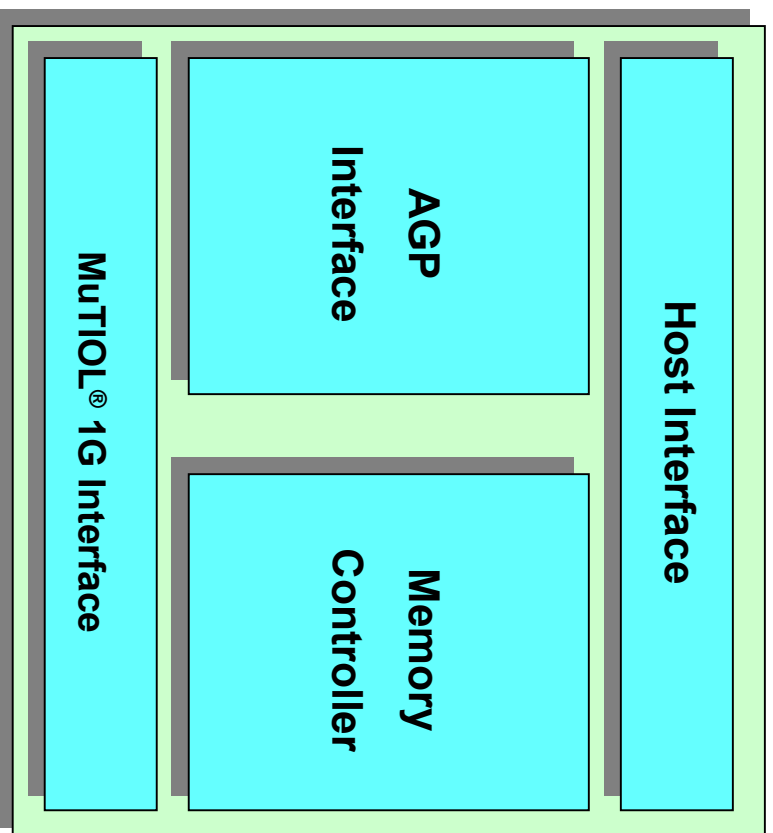
- **400MHz Front Side Bus**
- Support **DDR400/333/266 DDR SDRAM**
- Support AGP 8X/4X interface
- **MuTIOL® 1G Interface**
  - 1GB/s Bandwidth
  - Bi-Directional 16-bit Data Bus

748

SiS963L South Bridge Summary

SiS963L South Bridge Architecture

Ethernet Controller

IDE Controller

PCI Controller

AC97 Interface

USB 2.0

Power Management

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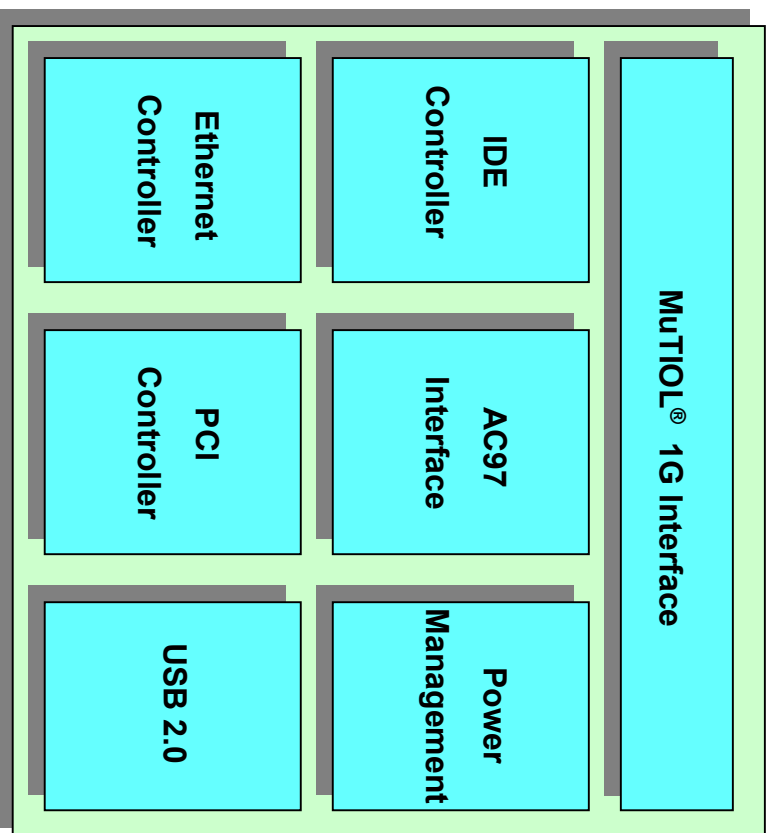
- Support ATA133/100/66/33
- USB2.0 for up to 6 ports
- 6 channels of AC97 speaker outputs
- Support V.90 HSP Modem
- ACPI 1.0b Compliance
- MuTIOL® 1G Interface
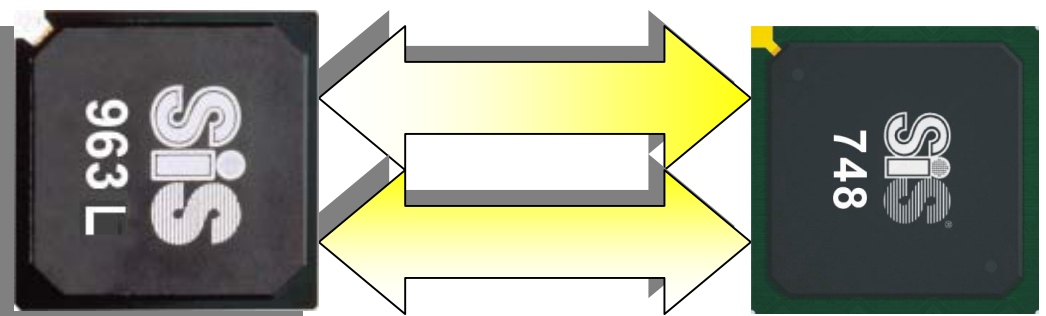 - 1GB/s Bandwidth
  - Bi-Directional 16-bit Data Bus

SiS
963 L

Leading Technology

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

MuTIOL® Technology

MuTIOL® 1G Delivering 1GB/s Bandwidth

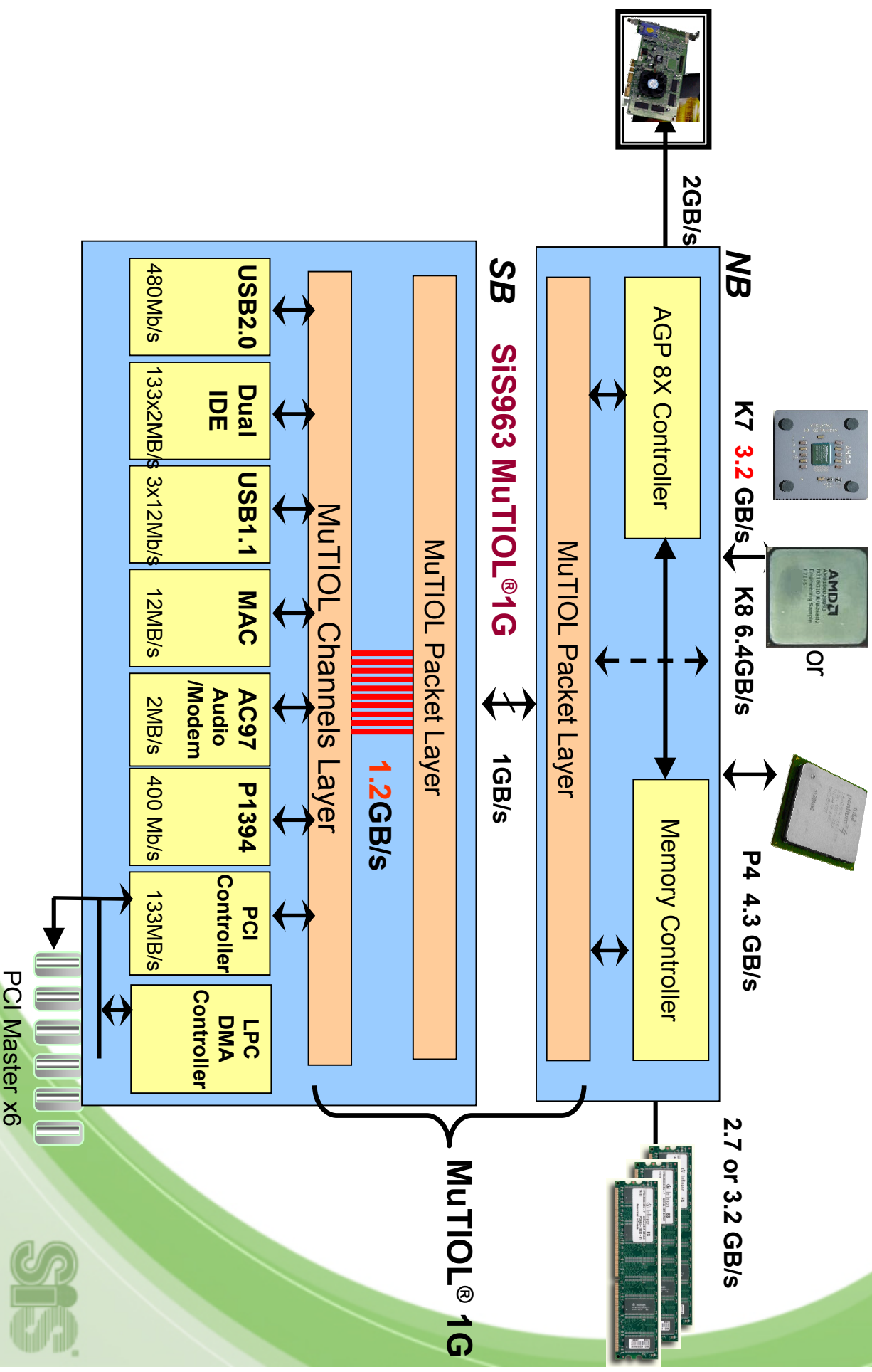**Bi-Directional 16-bit Data Bus at 533MHz Operating Frequency**

1GB/s

MuTIOL® Media I/O Family – Comparison Chart

South Bridge	961	961B	962	963	963L
MuTIOL®	533MB/s	533MB/s	533MB/s	1GB/s	1GB/s
ATA 133		O	O	O	O
USB 2.0			O	O	O
1394a			O	O	

MuTIOL® 1G Technology

--Sufficient Bandwidth for All DMA Master Devices Concurrent Accessing

NB

AGP 8X Controller

2GB/s

Memory Controller

K7 **3.2 GB/s**

K8 6.4GB/s

Or

P4 4.3 GB/s

2.7 or 3.2 GB/s

MuTIOL Packet Layer

SB   **SiS963 MuTIOL®1G**

MuTIOL Packet Layer

1GB/s

MuTIOL Channels Layer

1.2GB/s

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

MuTIOL® 1G

MuTIOL® 1G Technology Advantage

--Sufficient Bandwidth for connecting Northbridge and Southbridge

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

?

Device Layer: 1.2 GB

SiS963L
SiS MuTIOL® 1G

Ixx

Vxx

Bottleneck

266MB/s @ 33Mhz

533MB/s @ 66Mhz

>527 MB/s
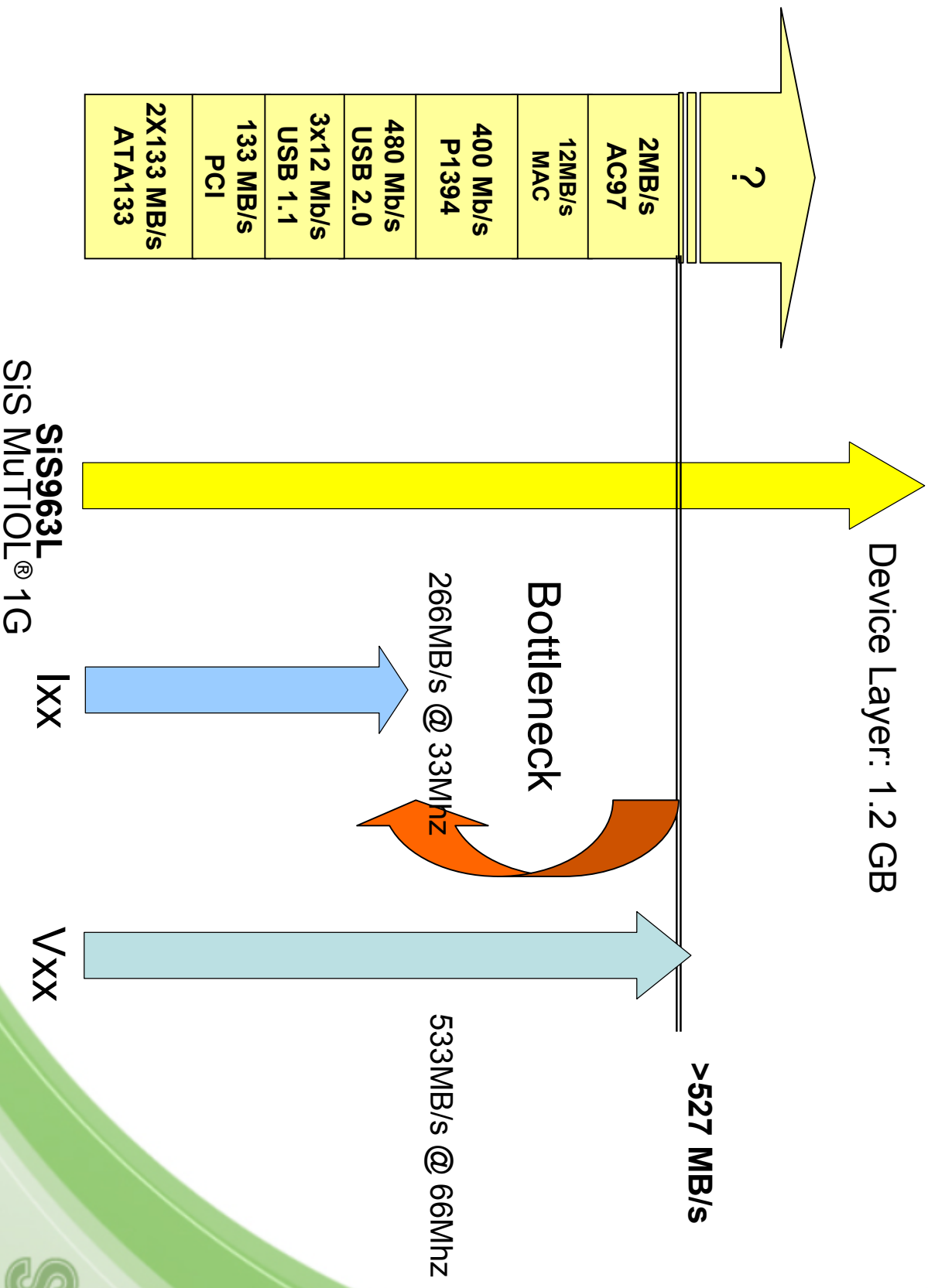
What is HyperStreaming Technology ?

- **"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

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
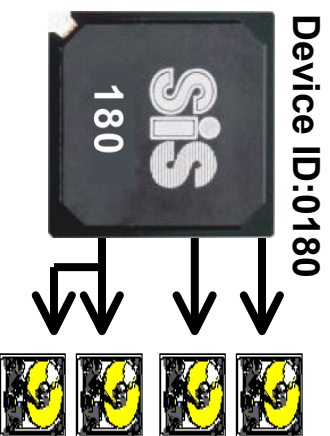 – No limitation of "Maximum 4 IDE devices Support"

SiS180 + SiS963L IDE Configuration -cont.

Device ID:5513

Device ID:0180
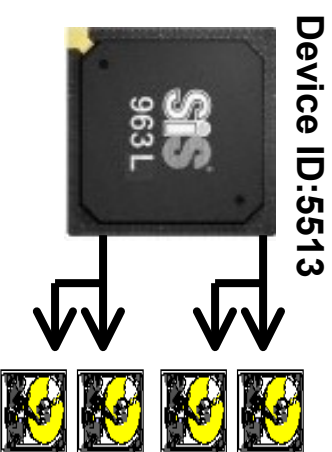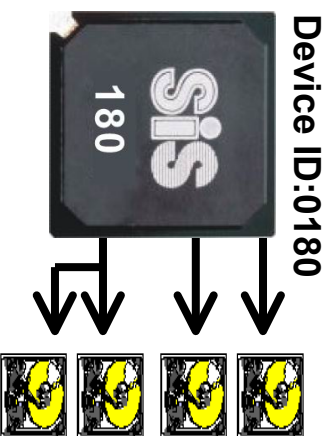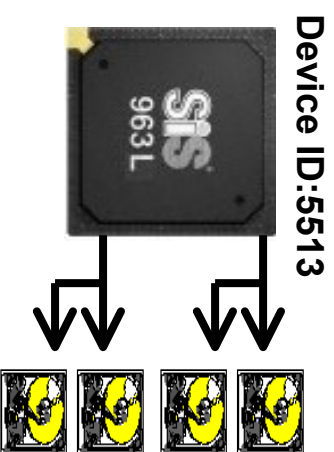
With Win98/WinMe Default IDE driver installed

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

Device ID:5513

Device ID:0180

- **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):

Data ABCDEF

S/W RAID

Disk1	Disk2
A	B
C	D
E	F
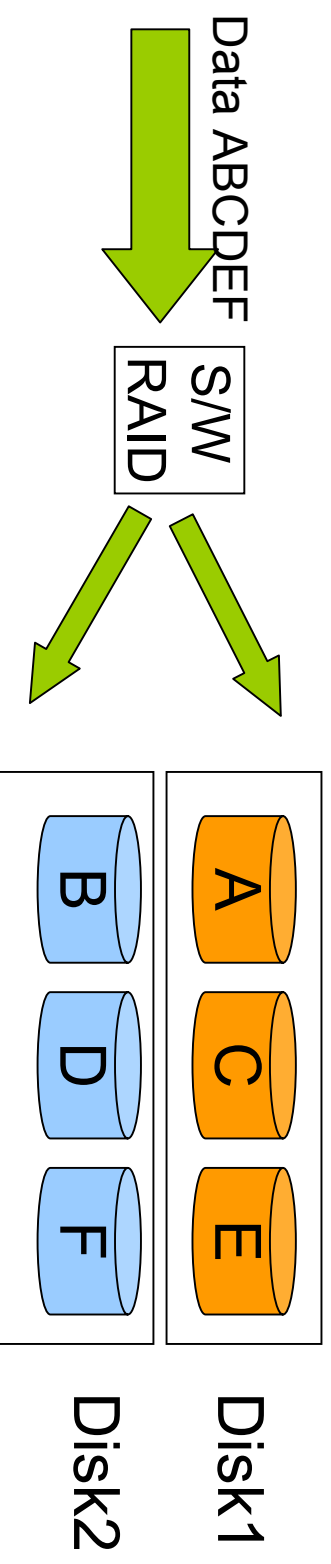
- RAID 0 implements a striped disk array, the data is divided into small blocks and each block is written to a separate disk drive.

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

- Requires a minimum of 2 drives to implement

SiS180 Software RAID Support

RAID 1 (Mirror):

Data ABC

S/W
RAID

| A | B | C | Disk1 |

| A | B | C | Disk2 |
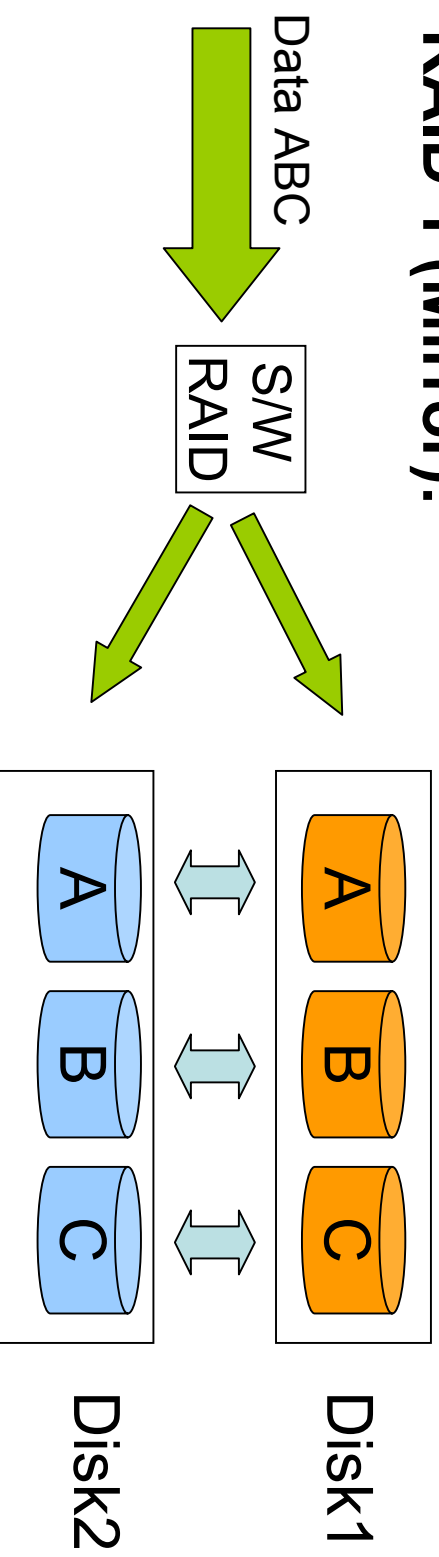
• RAID 1 implements a mirrored disk array, the data is written to one disk and copied to the replacement disk at the same time.

• 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:

Data ABCDEF

S/W RAID

		Disk1
A	C	E

		Disk2
B	D	F

		Disk3
A	C	E

		Disk4
B	D	F
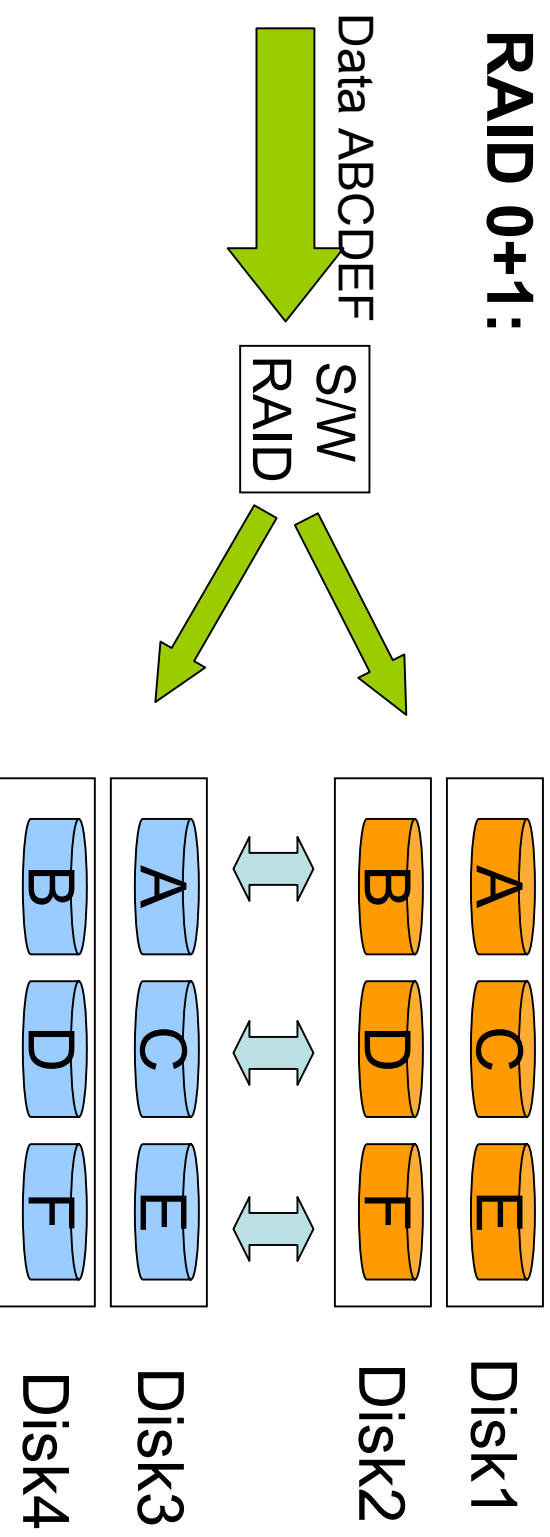
- RAID 0+1 implements a mirrored disk array, which element is a striped array. The data is written in the format of striping and copied to the replacement disk array at the same time.

- Providing the same level of rebuild capability of RAID1

- Requires a minimum of 4 drives to implement

SiS180 Software RAID Support

JBOD:

Data AB

S/W RAID

A — Disk1
B — Disk2

Disk3
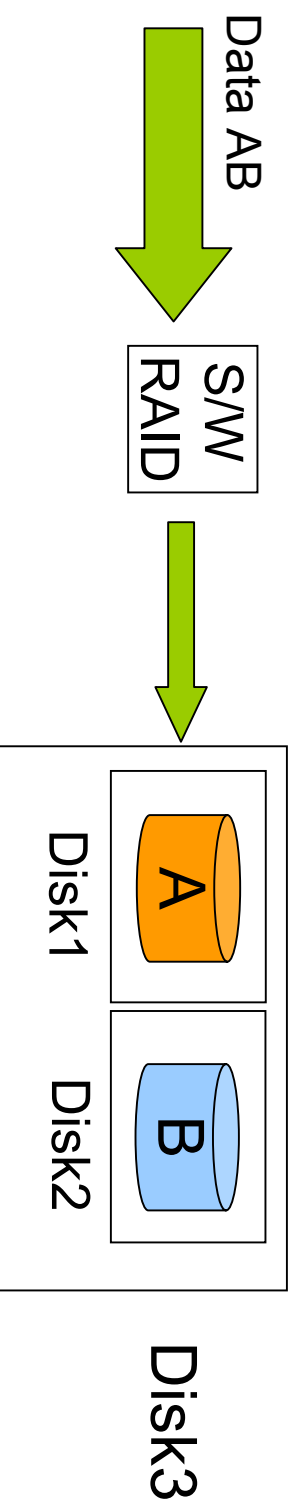
- JBOD combines two or more physical Disk to be single virtual Disk.
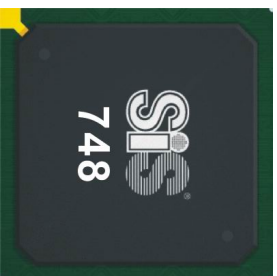- Requires a minimum of 2 drives to implement

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
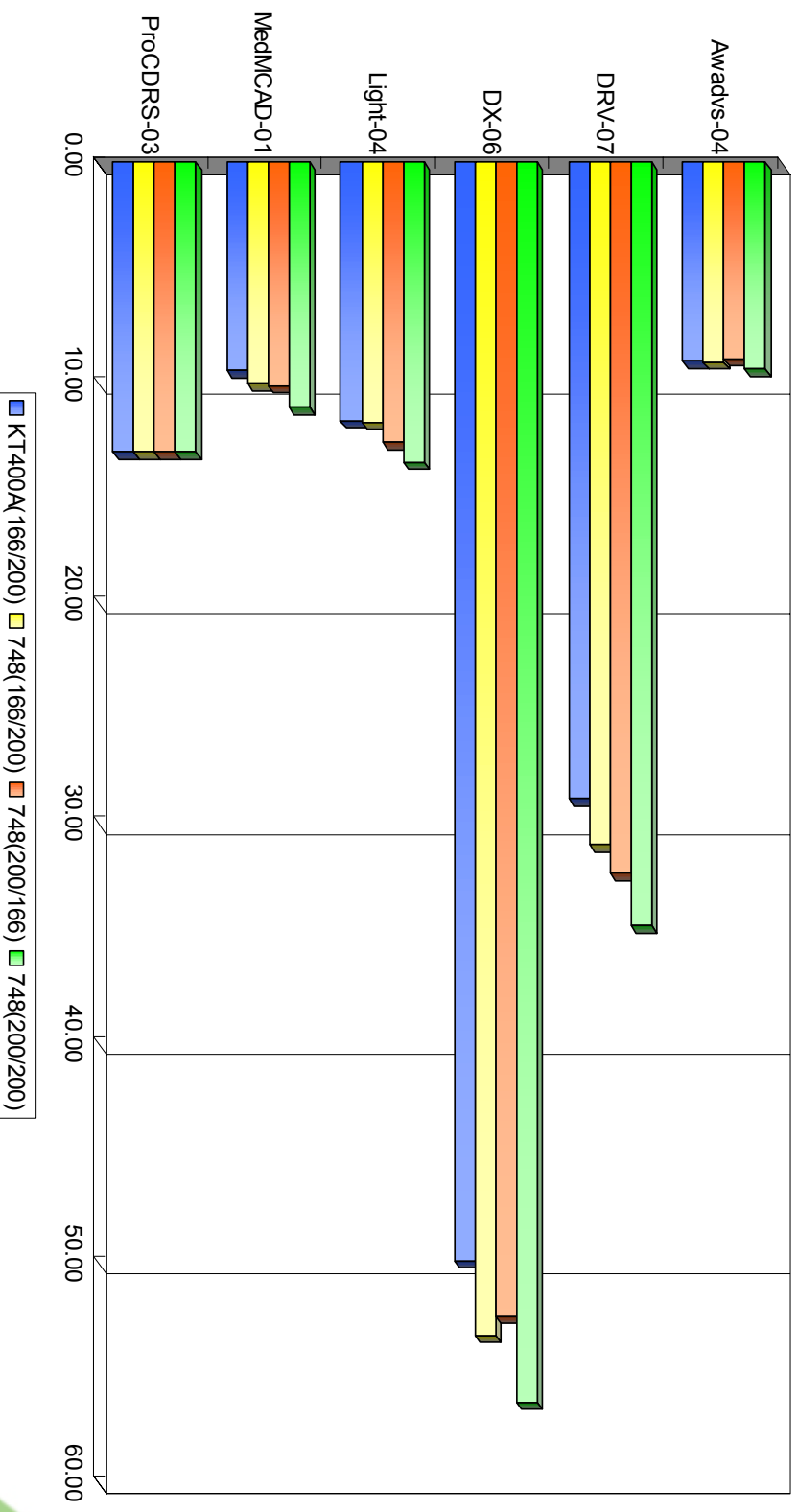 SiS748 DDR480 vs. DDR400

SiS748 VS KT400A

~ Feature List ~

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

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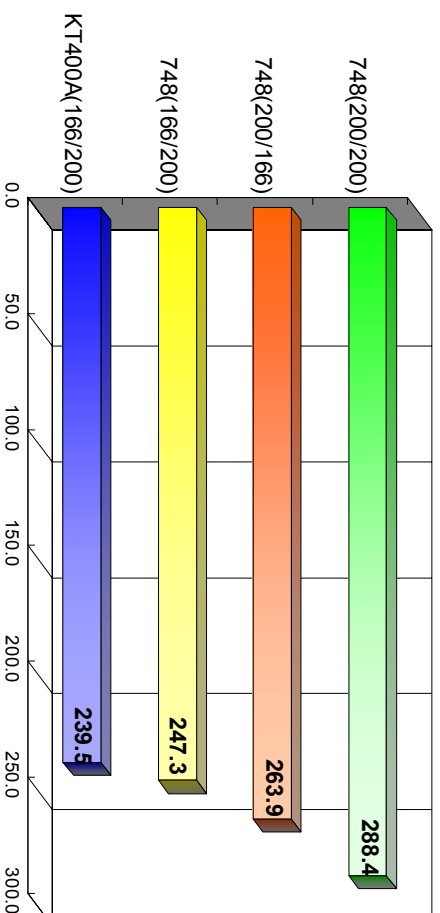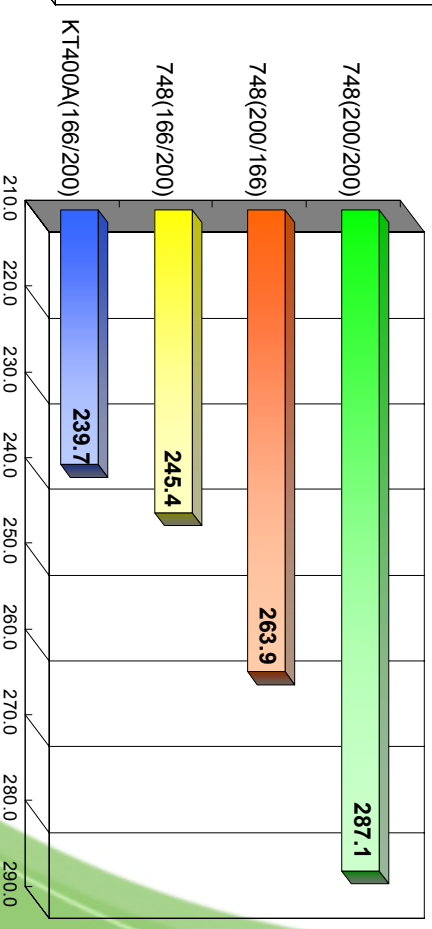*VGA Driver: ATi9700 6.13.10.6218*
HD: Maxtor 40G 7200 ATA133

Legend:
- KT400A(166/200)
- 748(166/200)
- 748(200/166)
- 748(200/200)

Categories: ProCDRS-03, MedMCAD-01, Light-04, DX-06, DRV-07, Awadvs-04

Axis: 0.00, 10.00, 20.00, 30.00, 40.00, 50.00, 60.00

SiS748 VS KT400A

3D Performance
~ Quake 3 ~

640x480x32bit

1024x768x32bit

640x480x32bit chart

Configuration	Value
748(200/200)	288.4
748(200/166)	263.9
748(166/200)	247.3
KT400A(166/200)	239.5

1024x768x32bit chart

Configuration	Value
748(200/200)	287.1
748(200/166)	263.9
748(166/200)	245.4
KT400A(166/200)	239.7

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
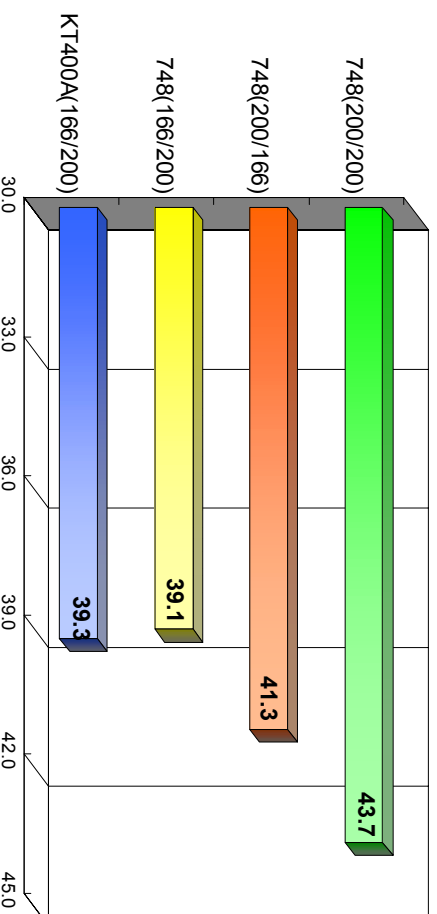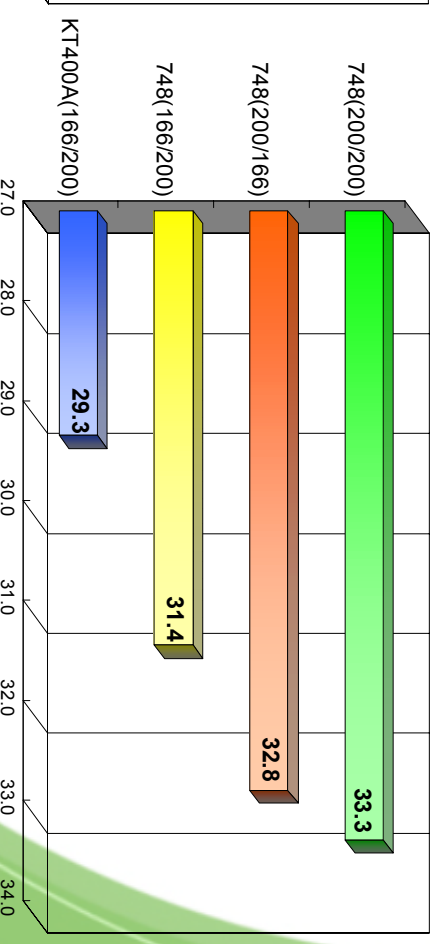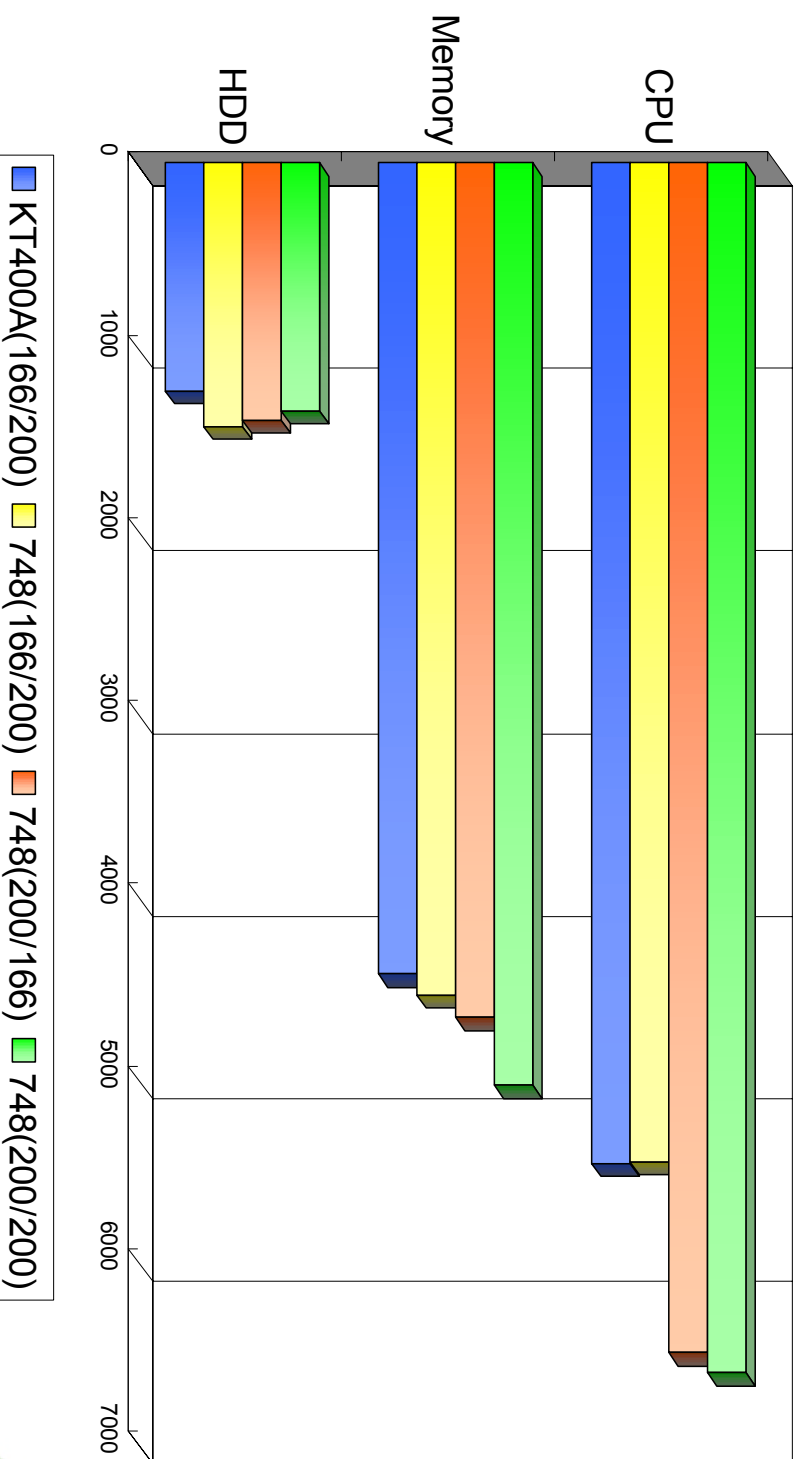*HD: Maxtor 40G 7200 ATA133*

SiS748 VS KT400A

System Performance
~ Winstone ~

Ccws2002

KT400A(166/200) 39.3
748(166/200) 39.1
748(200/166) 41.3
748(200/200) 43.7

Axis: 30.0 33.0 36.0 39.0 42.0 45.0

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

Bcws2002

KT400A(166/200) 29.3
748(166/200) 31.4
748(200/166) 32.8
748(200/200) 33.3

Axis: 27.0 28.0 29.0 30.0 31.0 32.0 33.0 34.0

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

SiS748 VS KT400A

System Performance
~ PC Mark2002 ~

Legend:
- KT400A(166/200)
- 748(166/200)
- 748(200/166)
- 748(200/200)

Categories: HDD, Memory, CPU

Axis: 0, 1000, 2000, 3000, 4000, 5000, 6000, 7000

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
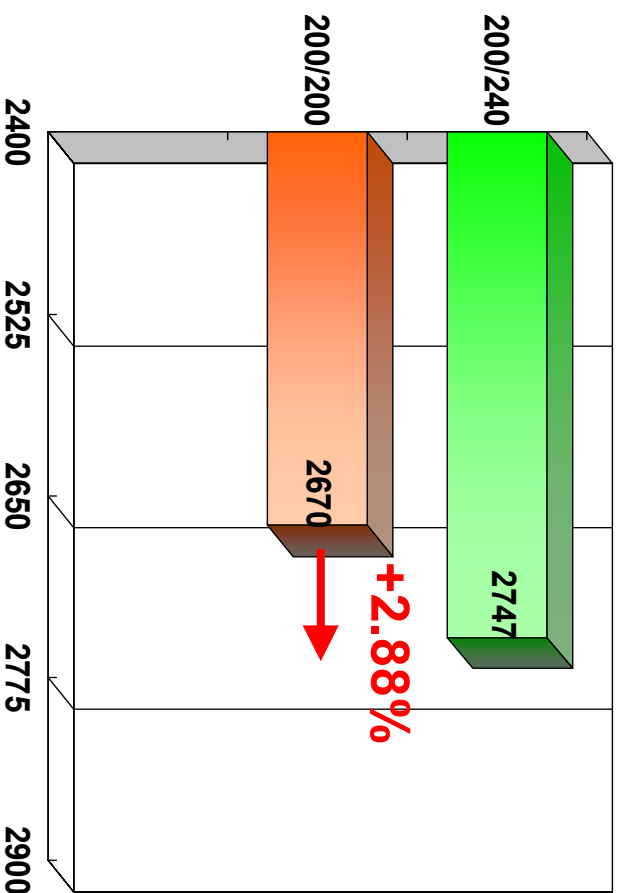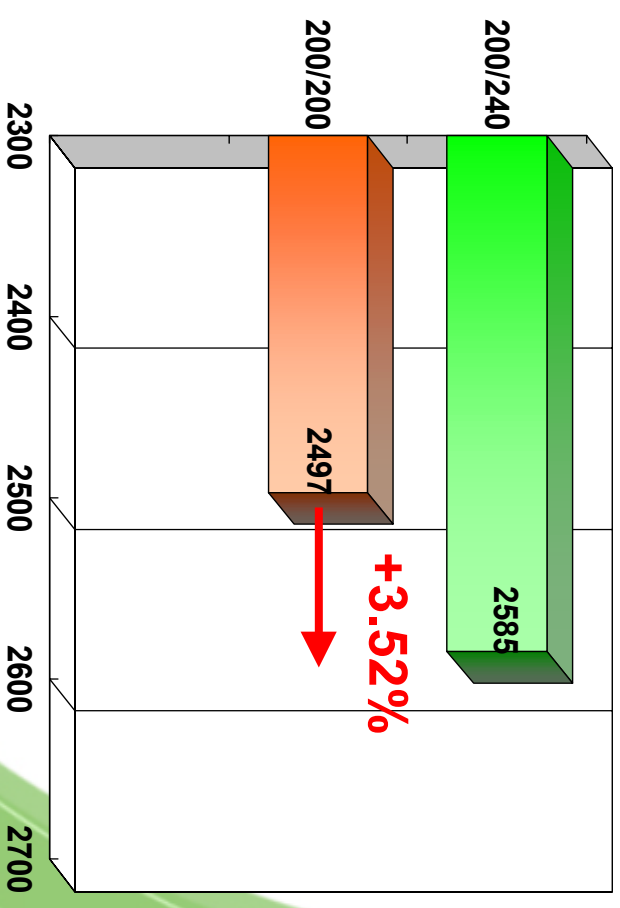HD: Maxtor 40G 7200 ATA133

The Miracle of DDR480 Overclocking

DRAM Performance

-SiS748

~Sandra 2003~

SiS748

CPU: AMD Athlon XP 2200+
DRAM: Hynix DDR400 512MB CL3T
VGA Driver: ATi9700 6.13.10.6218
HD: Maxtor Maxtor 40G 7200 ATA133

Int ALU/RAM Bandwidth

200/200	2670
200/240	2747

+2.88%

Scale: 2400, 2525, 2650, 2775, 2900

Float IPU/RAM Bandwidth

200/200	2497
200/240	2585

+3.52%

Scale: 2300, 2400, 2500, 2600, 2700

The Miracle of DDR480 Overclocking
-SiS748

3D Performance
~ Quake 3~

800x600x32bit

1280x1024x32bit

SiS748
CPU: AMD Athlon XP 2200+
DRAM: Hynix DDR400 512MB CL3T
VGA Driver: ATi9700 6.13.10.6218
HD: Maxtor Maxtor 40G 7200 ATA133

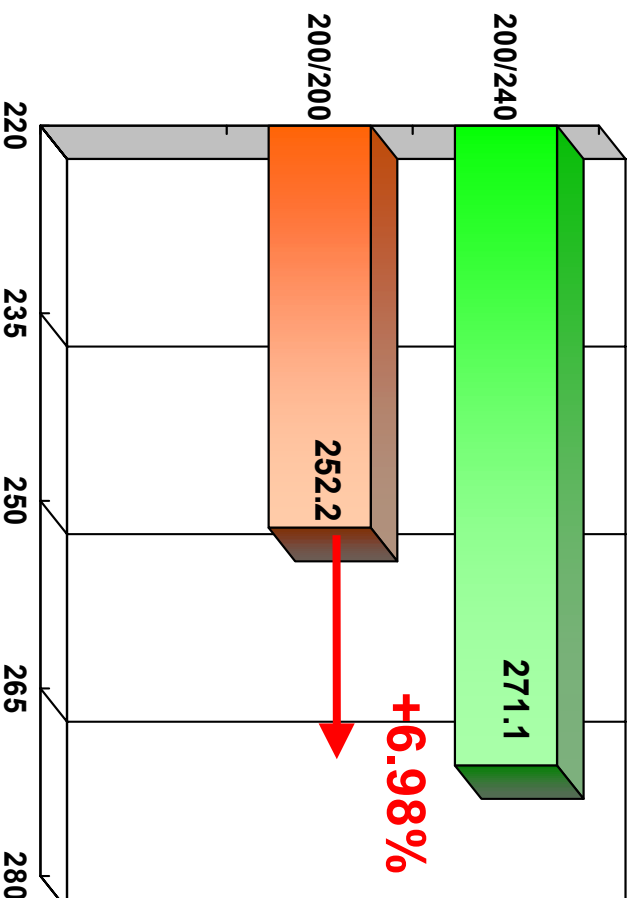200/200   252.2   +6.98%
200/240   271.1

200/200   232.8   +6.83%
200/240   250

The Miracle of DDR480 Overclocking
-SiS748

System Performance
~Winstone~
Ccws2002

SiS748
CPU: AMD Athlon XP 2200+
DRAM: Hynix DDR400 512MB CL3T
VGA Driver: ATI9700 6.13.10.6218
HD: Maxtor Maxtor 40G 7200 ATA133
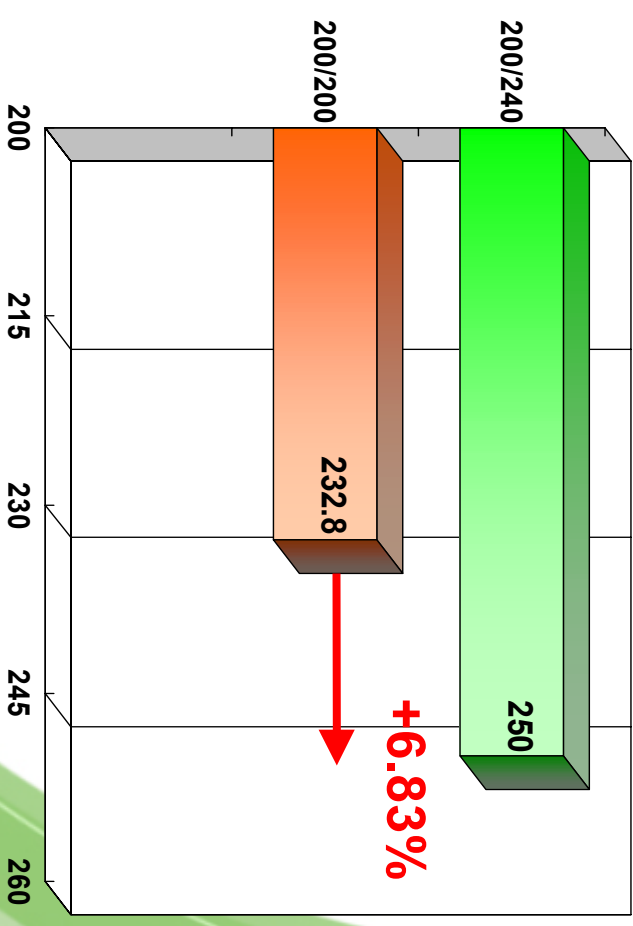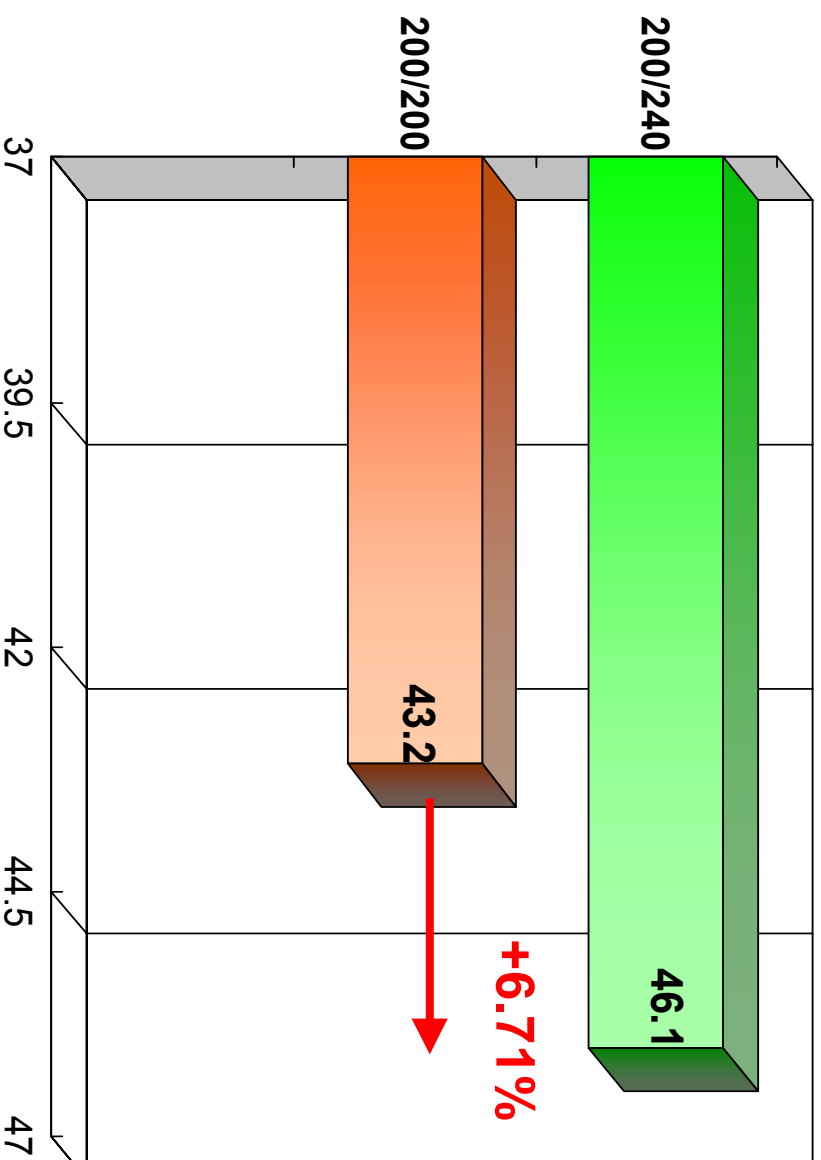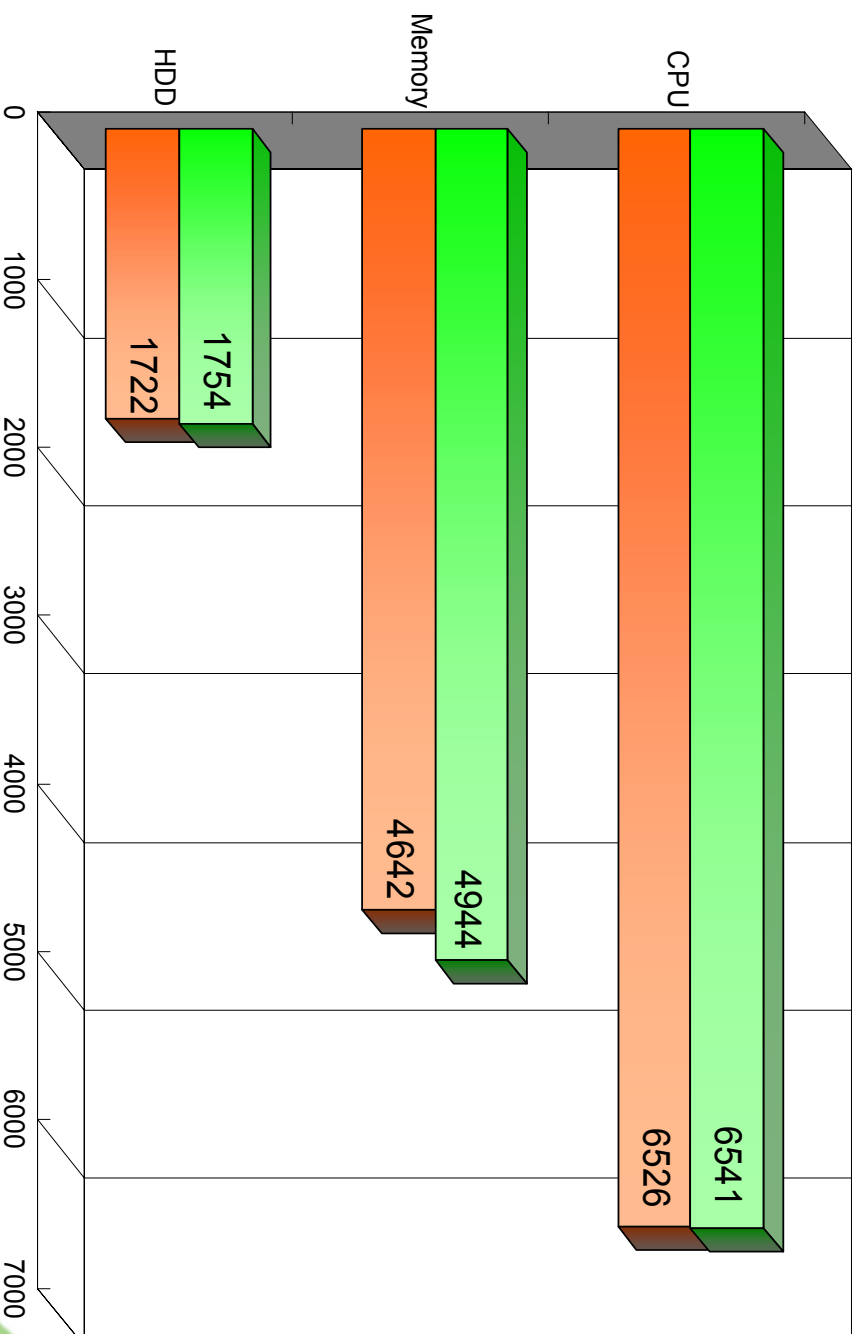
The Miracle of DDR480 Overclocking
-SiS748

System Performance
~PC Mark2002~

SiS748

CPU: AMD Athlon XP 2200+
DRAM: Hynix DDR400 512MB CL3T
VGA Driver: ATi9700 6.13.10.6218
HD: Maxtor Maxtor 40G 7200 ATA133

Legend:
- 200/200
- 200/240

Category	200/200	200/240
CPU	6526	6541
Memory	4642	4944
HDD	1722	1754

Product Status and Driver Support

Product Status

North Bridge- 748:

Sample :   Now

Mass Production :   Apr.

South Bridge- 963L:

Sample A0:   Now

Mass Production :   Now

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