



# VIA PT880 Chipset

## Introduction

November 2003



# VIA PT880 Highlights

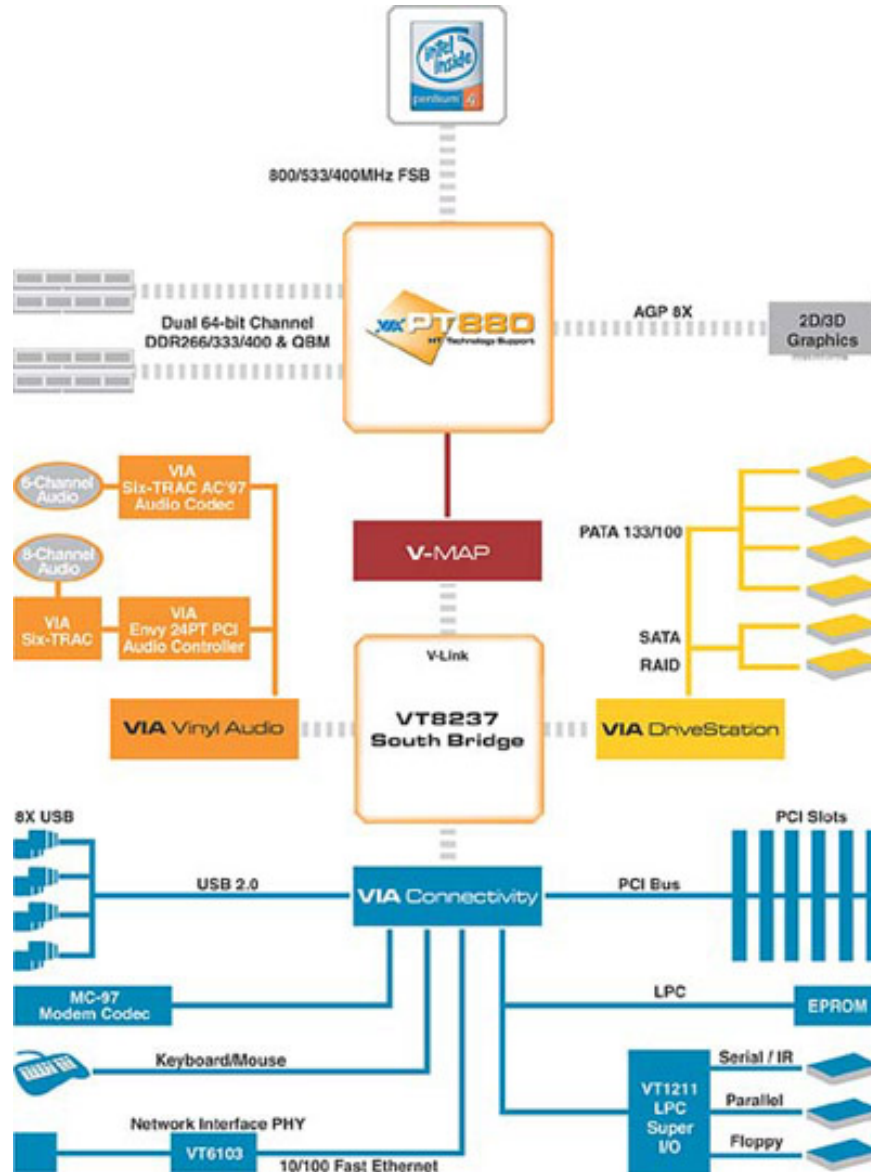
- **Bringing Intuitive Technology to the Intel® Pentium® 4 Platform**
  - **Exceptional Performance**
    - VIA DualStream64™ dual channel memory controller
    - Asynchronous bus design maximizes system optimization and flexibility
    - Optimized support for 800MHz/533MHz/400MHz FSB
    - Hyper-Threading Technology Support
  - **Rich Digital Media Experience**
    - AGP8X support for state of the art graphics
    - VIA Vinyl™ Multichannel Audio Suite for superlative integrated and onboard 6-channel and 8-channel surround sound
  - **Cutting-Edge Storage Technology**
    - Serial ATA and V-RAID integrated in the VT8237 South Bridge
  - **Unrivaed Stability & Reliability**
    - Unified VIA Hyperion 4-in-1 Driver
  - **Ultra V-Link Interconnect**
    - 1066MB/s link between the North and South Bridge
  - **Global Availability**
    - Multiple design wins from the world's leading motherboard manufacturers

# VIA DualStream64™



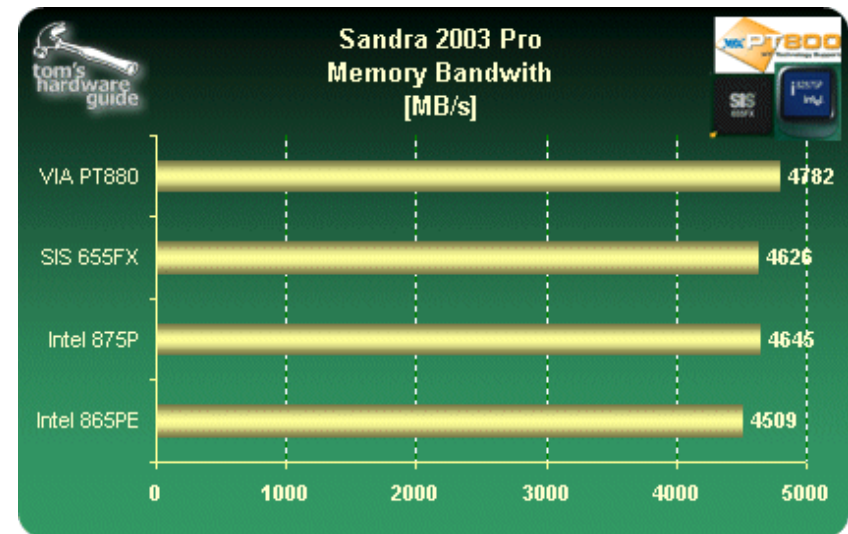
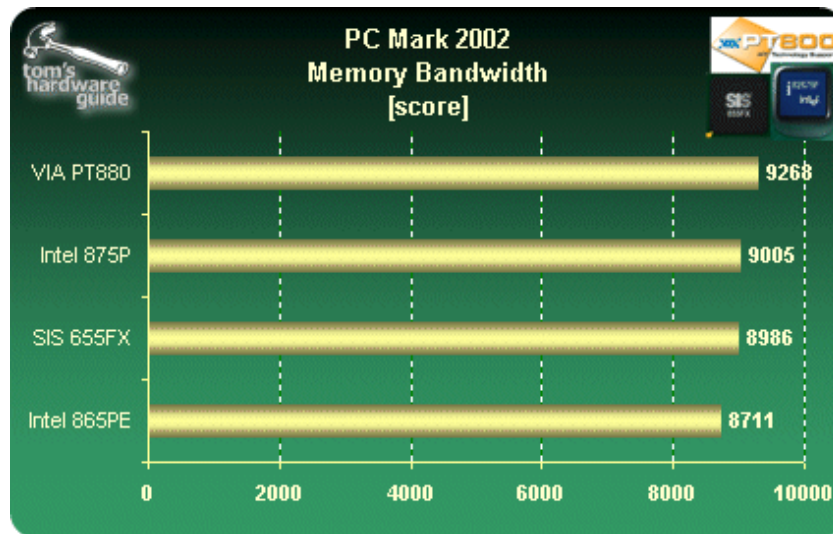
- World's most intelligent dual channel DDR 400 memory controller for optimum system performance
- Lightning fast access to system memory enabled by revolutionary new intuitive technologies:
  - Enhanced data prefetch protocol
  - Improved memory branch prediction and larger on-chip branch table
  - Tighter read/write turnaround for improved clock timings

# VIA PT880 Platform Architecture



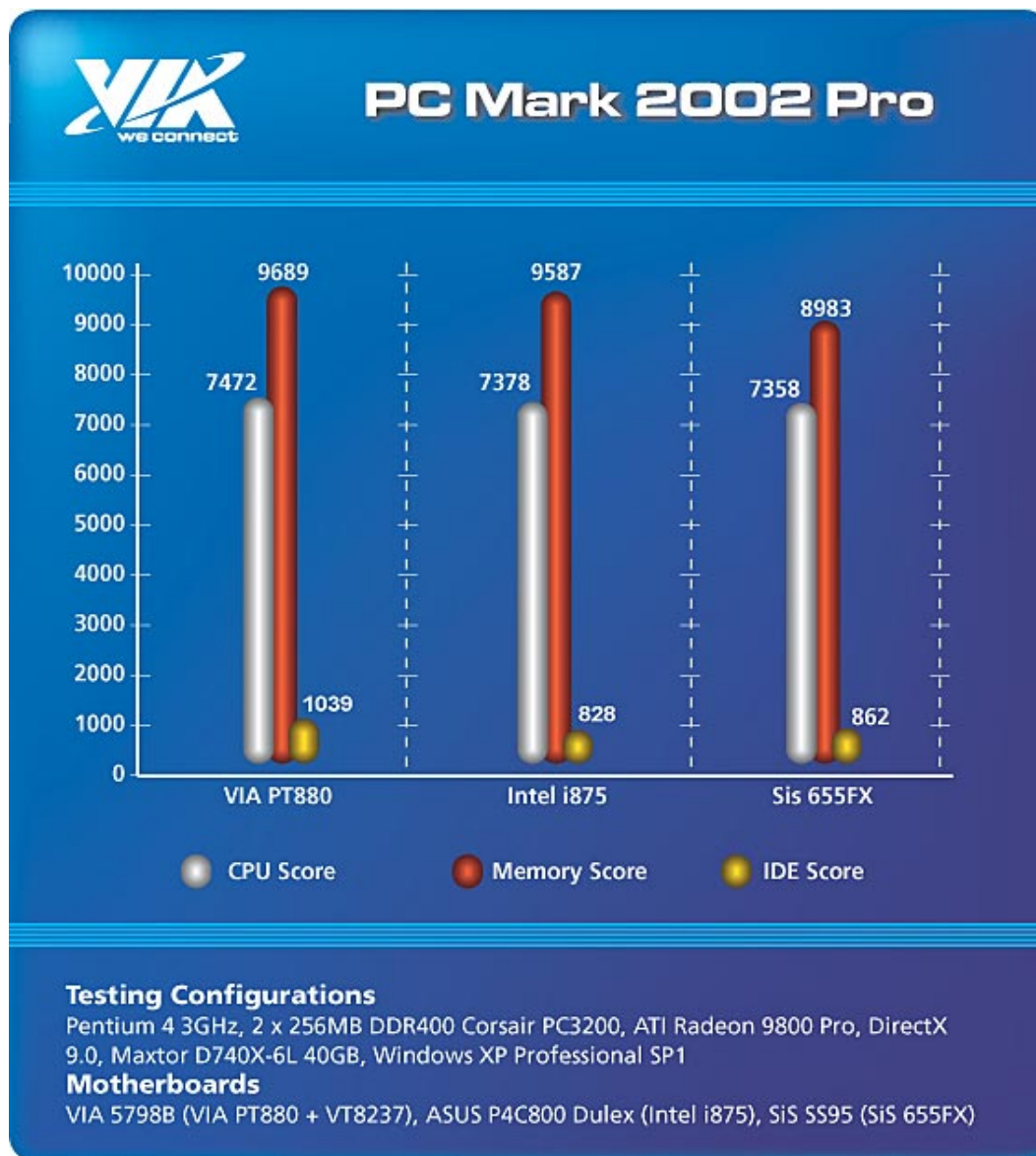
# Unmatched Memory Performance

- The VIA DualStream64 memory controller enables unparalleled levels of dual channel DDR400 memory bandwidth



*"VIA manages to achieve the best memory bandwidth numbers, which obviously is made possible by the new memory interface." – Tom's Hardware Guide*

# Unmatched System Performance





# Most Scalable Platform for the Intel® Pentium® 4

- VIA's flexible and highly scalable architecture allows motherboard manufacturers to cover all market segments and price points
  - **VIA Networking Gigabit Ethernet**
    - Single chip 10/100/1000 design
    - Advanced software interface
  - **VIA Vinyl Audio**
    - VIA Vinyl integrated 6-channel surround sound
    - VIA Vinyl Gold onboard 8-channel surround sound
  - **Advanced Connectivity Options**
    - VIA VT6307 1394 Controller
  - **VIA VPX2 for Servers**
    - 133MHz PCI-X support
    - Up to 12 standard PCI connections



**FireWire**



# Industry's Most Comprehensive Portfolio of Scalable Solutions

	VIA	Nvidia	Intel
1394 Controller	✓	X	X
10/100 Ethernet (MAC & PHY)	✓	X	✓
Gigabit Ethernet (MAC & PHY)	✓	X	✓
Complete 5.1 Audio Solution (Controller + Codec)	✓	X	✓
Complete 7.1 Audio Solution (Controller + Codec)	✓	X	X
TV-Out	✓	X	X
Serial RAID Controller	✓	Not Ready	✓



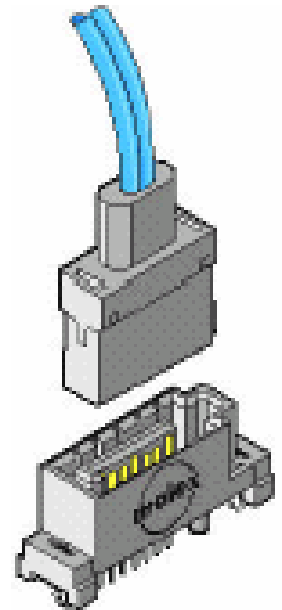
# VT8237 South Bridge Overview



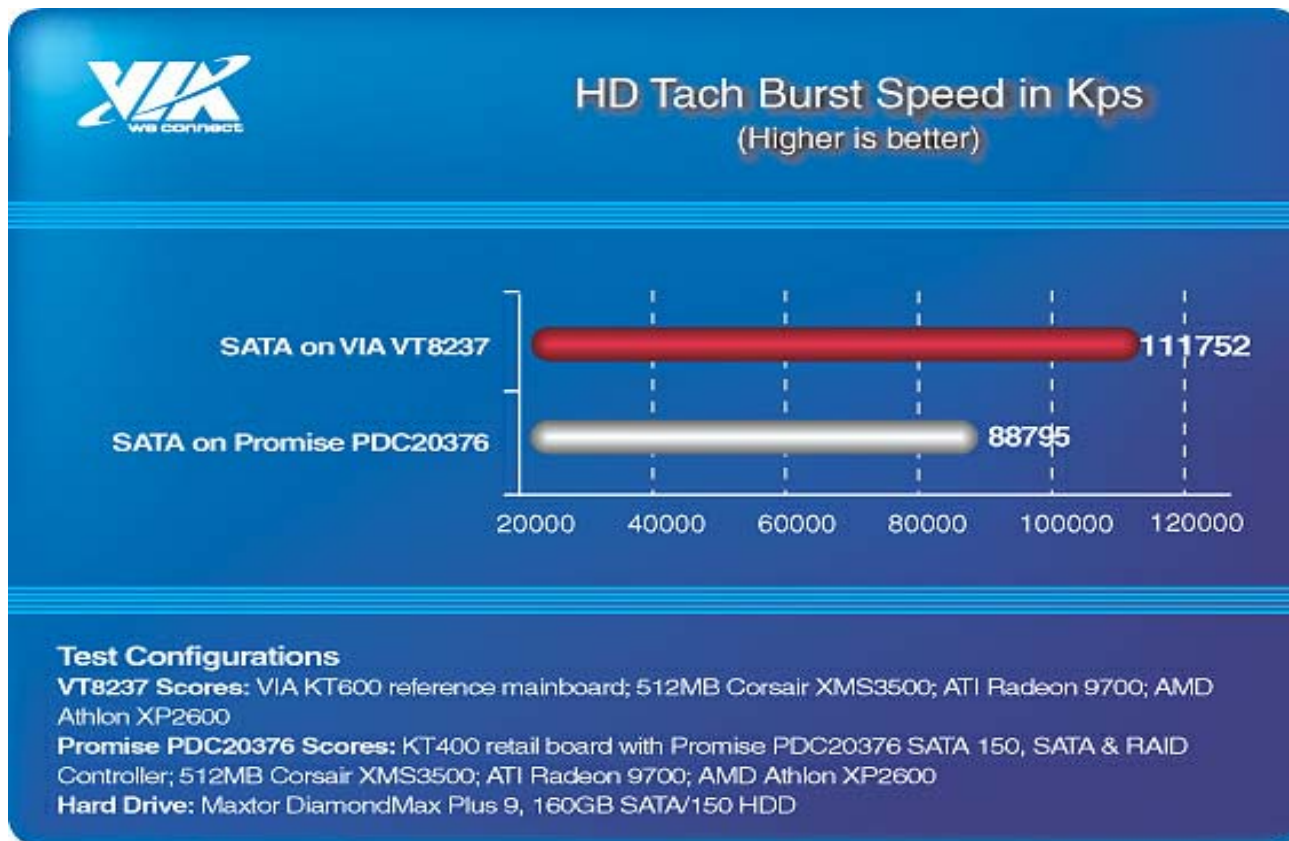
- **VIA DriveStation™ Controller Suite**
  - **Serial ATA**
    - Full duplex high performance 150MB/s Dual Channel Serial ATA interface
    - Support for additional two Serial ATA devices
  - **V-RAID**
    - Serial RAID controller for RAID 0, RAID 1, RAID 0+1 and JBOD
    - User-friendly Windows-based V-RAID software interface
  - **Parallel ATA 133**
    - Supports up to four PATA devices
- **VIA Advanced Connectivity Suite**
  - **USB 2.0 Controller**
    - Support for 8 USB 2.0/1.1 ports
  - **Network Controller**
    - Enterprise Class 10/100Mbps Fast Ethernet MAC
  - **PCI & LPC bus controllers**
- **VIA Vinyl™ Multichannel Audio Suite**
  - **VIA Vinyl integrated 6-channel surround sound**
    - AC '97 audio
    - VIA Six-TRAC codec
  - **VIA Vinyl Gold onboard 8-channel surround sound**
    - 24/96 resolution audio
    - VIA Envy24PT + VIA Six-TRAC Codec + additional DAC
  - **VIA Stylus Audio Drivers**
    - Integrated Sensaura technology
    - Full 3D gaming support
- **V-MAP Architecture**
  - **Ultra V-Link**
    - High speed 533MB/s South Bridge/North Bridge interconnect
    - Supports current generation VIA North Bridges across all processor platforms
  - **VIA Hyperion 4in1 Unified Drivers**
    - Optimized system performance and stability

# Leading the Way with Native Serial ATA

- **Full Duplex High Performance 150MB/s per Port Dual Channel Serial ATA interface**
  - Direct support for two SATA devices
  - Bypasses PCI Bus; flies straight to the 512 MB/s V-Link chip interconnect for superior performance in the most data intensive applications
  - SATALite™ interface expands support to four SATA devices through external Serial ATA PHY
- **Easier Configuration**
  - Instant recognition by the Operating System for “on the fly” installation
  - No Master/Slave configurations
  - Full backward Parallel ATA compatibility for seamless migration path
- **System Design Innovation**
  - Simpler cabling for improved airflow and easier system installation
  - Reduced pin-count to minimize use of valuable mainboard real estate
  - Lower power & lower voltage for smoother small form factor and low profile system design implementations



# VIA DriveStation Native Serial ATA Performance



# VIA DriveStation V-RAID

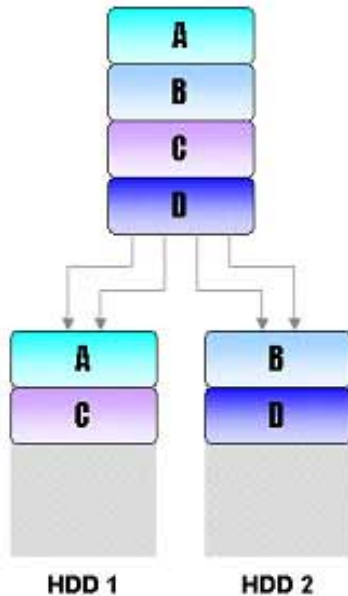


- **Industry's first full-featured native Serial RAID solution to be integrated into PC core logic chipset architecture**
  - Supports RAID Levels 0, 1 & 0+1<sup>1</sup>
  - Highest HDD Data Transfer Rates for Maximum System Performance
  - Superior Fault Tolerance for Optimum Data Integrity
- **Ease of Use**
  - Easy installation and array management with user-friendly V-RAID Software Interface
  - VIA's DriveThru™ technology enables "on-the-fly" upgrades to RAID configurations
- **Bringing RAID to the Mainstream**
  - Integrated V-RAID H/W and S/W solution reduces overall system cost
  - Easy installation and user-friendly software removes technical barriers

<sup>1</sup>RAID Level 0+1 only supported on motherboards and systems where support for two additional Serial ATA drives has been added through the integration of the VIA SATA Lite interface.

# VIA DriveStation V-RAID Configurations

## RAID Level 0



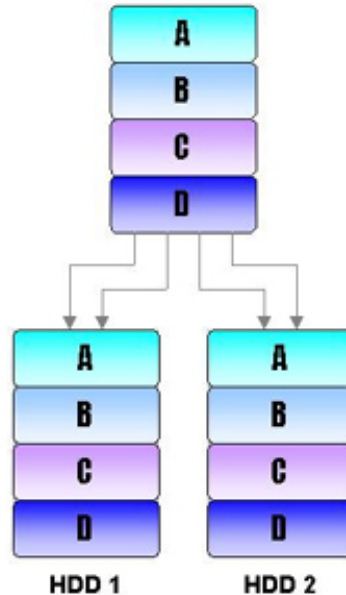
**Effect:** Striping

**Capacity:** 100%

**Performance:** High

**Fault Tolerance:**  
Low

## RAID Level 1



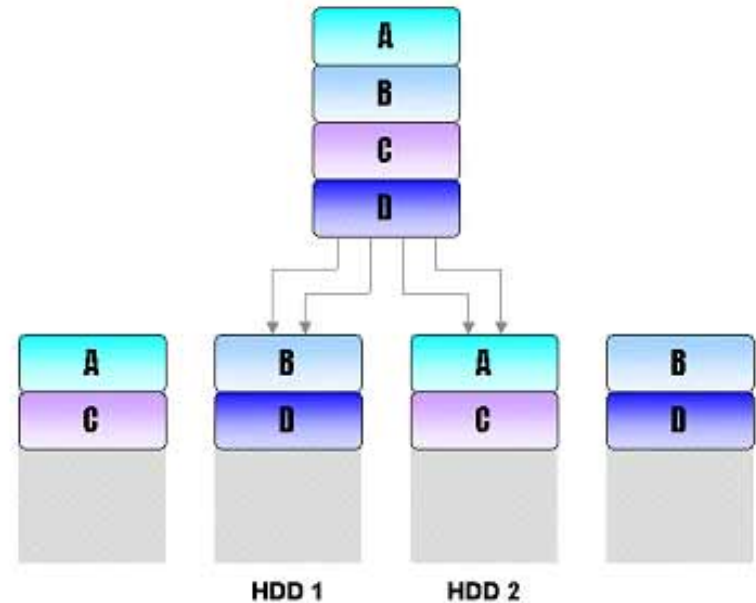
**Effect:** Mirroring

**Capacity:** 50%

**Performance:**  
Normal/High

**Fault Tolerance:**  
High

## RAID Level 0+1<sup>1</sup>



**Effect:** Mirroring & Striping

**Capacity:** 50%

**Performance:** High

**Fault Tolerance:** High

<sup>1</sup>RAID Level 0+1 only supported on motherboards and systems where support for two additional Serial ATA drives has been added through the integration of the VIA SATA Lite interface.

# VIA VT8237: Unmatched Support for Latest Storage Technologies

	VIA	Nvidia	Intel
Native Serial ATA	✓	Not Ready	✓
Serial ATA Ports	4 <sup>†</sup>	2*	2
Integrated RAID	✓	Not Ready	✓
RAID 0	✓	X	✓
RAID 1	✓	X	✓
RAID 0+1	✓	X	X
JBOD (Spanning)	✓	X	X

\* Requires addition of 2 Silicon Image IDE-to-SATA Bridge Chips

<sup>†</sup> VIA VT8237 supports 2 native SATA ports and 2 further ports with implementation of SATALite interface

# VIA Velocity™ Line of Gigabit Ethernet Controllers

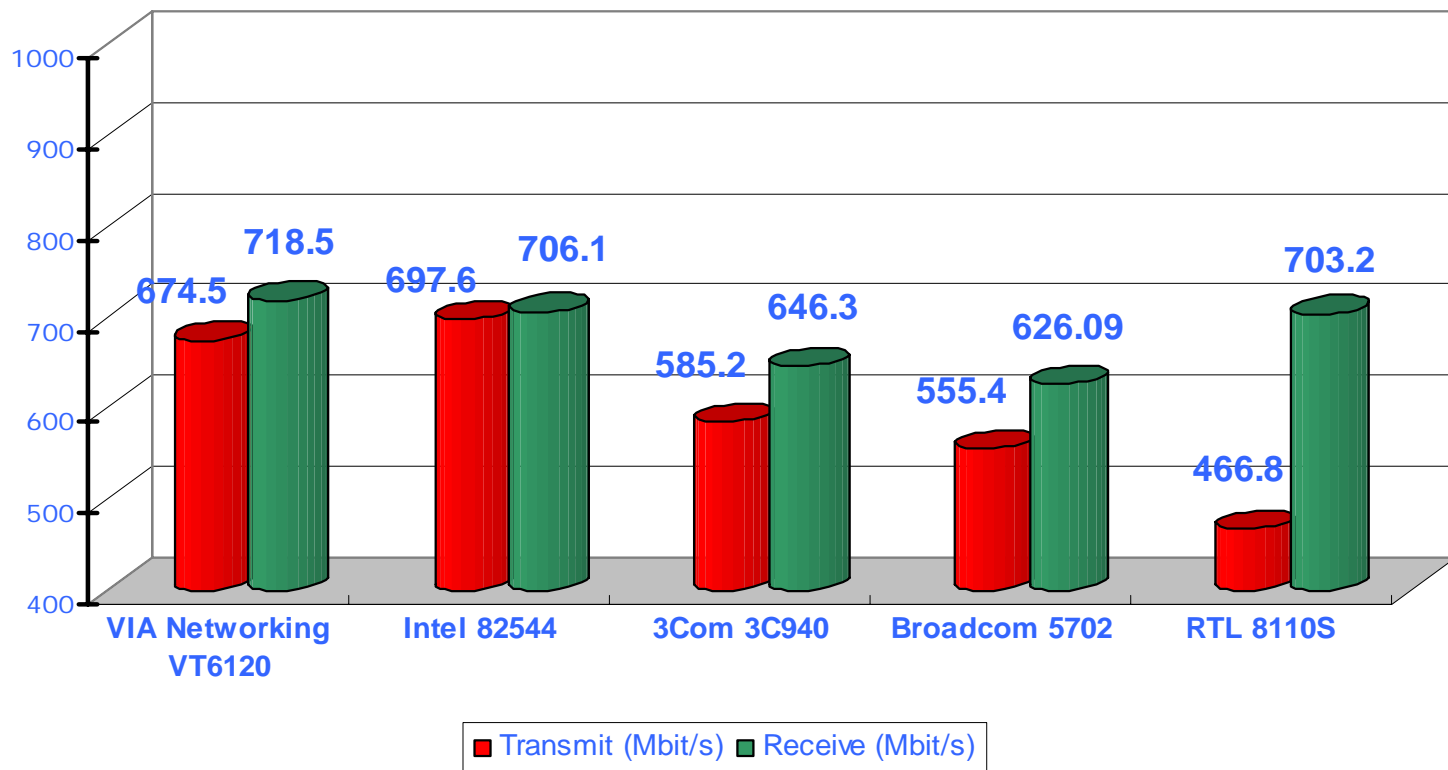
- **Industry's Most Complete Gigabit Ethernet solution**
  - Single chip 10/100/1000 design
  - Ready now!
  - Integrated Cicada SimpliPHY™ Technology
    - Delivers superior real world Gigabit performance
  - GigaCheck™ Software Interface
    - Advanced operations analysis while link is running
    - Most complete Diagnostic Software Interface
      - Connection speed
      - Link Quality
      - Cable Analysis
      - Diagnostics
      - Wake-on-LAN





# VIA Velocity: Fastest Gigabit Ethernet on the Market

## Gigabit Networking Throughput



Configuration: Asus P4P800 Motherboard, Pentium 4 2.4GHz, 512MB DDR 400, ASUS AGP-V7100 (GeForce 2 MX), Windows XP Professional

# VIA Vinyl™ Multichannel Audio Suite

- **VIA Vinyl Audio**

- Richest choice of market leading integrated and onboard audio performance options

- **VIA Vinyl integrated 6-channel surround sound**



- VIA Vinyl AC '97 audio controller
- VIA Six-TRAC codec

- **VIA Vinyl Gold onboard 8-channel surround sound**



- VIA Envy24PT + VIA Six-TRAC + additional DAC
- Only onboard audio solution with 8-channel immersion audio
- 24/96 resolution digital outputs

- **VIA Stylus Audio Driver**



- Combo audio driver
- Integrated Sensaura Technology
- Awesome 3D positional audio effects
- Full gaming support



# Unparalleled Audio Support

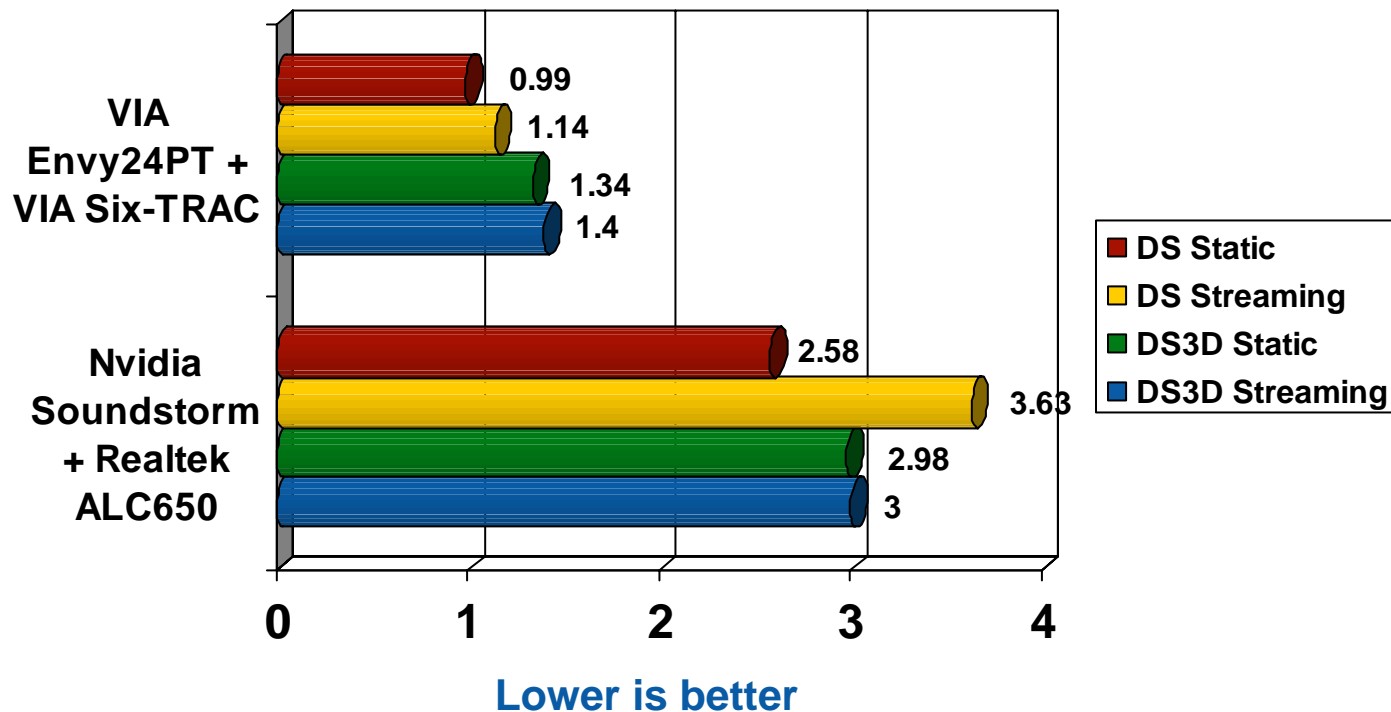
*VIA offers the industry's most comprehensive portfolio of advanced Audio Platform Solutions to meet today's multimedia requirements*

	VIA	Nvidia	Intel
8-channel Surround Sound Support	✓	X	X
24/96 Audio Support	✓	X	X
3D Gaming Support*	✓	✓	X
Analog Codec for Complete Solutions	✓	X	X

\* Sensaura support

# Benchmarking Comparison of Audio Gaming Performance

## Audio Winbench



"The State of Motherboard Audio" July 1, 2003

Albatron PX865PE ProII MB integrating VIA Envy24PT & Six-TRAC

# What people are saying about onboard VIA audio...



"This 24-bit/96kHz solution is definitely a step in the right direction, as we'd love to find this type of high quality audio on many more motherboards to come."



"Against the integrated competition...(an nForce2 board and an ICH4-based motherboard)... the Zenith 9CJS's Envy24PT-powered audio definitely sounded better for music playback."



"Looks like this will be the best onboard sound I've ever heard."

# V-MAP Architecture

- **Ultra V-Link**

- High throughput 1066MB/s South Bridge/North Bridge interconnect
- Supports new generation of VIA North Bridge options across all processor platforms

- **Pin-to-pin Compatible Architecture**

- Flexible, high bandwidth architecture for all Intel Pentium 4 and Celeron™ processors
- Reduced motherboard design process and improved time-to-market

- **VIA Hyperion 4in1 Unified Drivers**

- Optimized system performance and stability
- Regular updates
- Downloads and support at [www.viaarena.com](http://www.viaarena.com)
- Reducing support costs for VIA and VIA motherboard customers



# VIA PT880 Motherboard Partners



Design wins from the world's  
leading motherboard manufacturers



# VIA PT Series North Bridge Roadmap

## PT800

- P4 @ 400/533/800MHz, HT Technology
- DDR266/333/400, ECC
- AGP 4X/8X
- 8X V-Link
- MP: Now

## PT880

- P4 @ 400/533/800MHz, HT Technology
- Dual 64bit Channels DDR266/333/400, ECC
- AGP 4X/8X
- Ultra V-Link
- MP: Now

## PT890

- P4 @ 400/533/800MHz, HT Technology
- Dual 64bit Channels DDR-1 266/333/400 & **DDR-2** 400/533/667, ECC
- **PCI Express**
- Ultra V-Link
- Sample: Dec 03
- MP: Q1'04

# VIA South Bridge Roadmap

## VT8237

- Ultra V-Link
- **Total 6 HDD support:**
  - 2 Serial ATA ports
  - 2 IDE channels for up to 4 ATA133 devices
- V-RAID
  - RAID 0,
  - RAID 1,
  - RAID 0+1
  - JBOD support
- VIA Vinyl Audio
- 8 x USB 2.0
- VIA 10/100 MAC
- MII Interface w/ Ext. PHY
- Int. IO/APIC
- **MP: Now**



## VT8239

- Ultra V-Link
- **Total 8 HDD support:**
  - 4 Serial ATA ports
  - 2 IDE channels for up to 4 ATA133 devices
- SATA Controller with command queue
- AHCI
- V-RAID
  - RAID 0,
  - RAID 1,
  - RAID 0+1
  - JBOD support
- VIA Vinyl Audio
  - 96K/20-bit audio
- 8 x USB 2.0
- VIA 10/100 MAC
- MII Interface w/ Ext. PHY
- Int. IO/APIC
- **S: Q4'03**





# Thank You