VIA ProSavageDDR PN266T

Empower Your Mobile With DDR

VIA ProSavageDDR PN266T: Delivering unmatched performance and extended battery life in next generation mobile systems

Mobile systems are accounting for an increased proportion of new PC sales, with consumers often choosing the convenience of a notebook PC in preference to a desktop system. This trend is demanding more from mobile systems, with a balance of desktop equivalent performance and extended battery life expected by end users. The VIA ProSavageDDR PN266T mobile integrated graphics chipset with DDR memory, enables this balance to be achieved by providing a platform for cost effective and high performance mobile systems with extensive communication and networking feature sets.

The launch of the VIA ProSavageDDR PN266T chipset brings ultra fast DDR SDRAM memory to Intel® Pentium® III Processor-M, Intel® Pentium® III, Intel® Celeron™ and VIA C3™ processor based mobile systems for the first time, bursting through the performance barrier imposed by PC133 SDRAM. In addition to better performance, DDR SDRAM also lowers memory subsystem power consumption by more than 30%, extending battery life and reducing heat dissipation enabling professional performance in svelte and stylish designs. Combined with the proven performance of the cost efficient, space saving S3 Graphics ProSavage8™ 2D/3D engine integrated into the chipset North Bridge, the VIA ProSavageDDR PN266T yields powerful professional mobile systems at highly competitive price points.

The VIA ProSavageDDR PN266T benefits from the following key technologies:

- **DDR200/266 SDRAM Support**: The VIA ProSavageDDR PN266T offers up to 2.1GB/s of memory bandwidth with its support for up to 4GB DDR266 SDRAM. This provides memory intensive applications (such as content creation, media streaming, 3D gaming, etc.) the bandwidth they need to perform optimally and increases the data throughput available to the integrated graphics core. As well as increasing performance DDR266 SDRAM enables a more than 30% reduction in memory subsystem power consumption, running at only 2.5V.

- **S3 Graphics ProSavage8™ Integrated Graphics core**: The ProSavage8™ 2D/3D Accelerator with internal AGP 8X bandwidth and DVD Motion Compensation is optimized for use with the Microsoft Windows® XP operating system and drives integrated graphics in mobile systems to a new level. Shared Memory Architecture (SMA) enables the PN266T to utilize the system memory for frame buffer and texture memory on an internal data path doubled to 128-bit capacity. Thus, the DDR memory subsystem, offering up to 2.1GB/s of memory bandwidth, increases the overall performance of the integrated graphics core by up to 50% over SMA chipsets based on PC133 SDRAM. Integrated graphics also offers lower system power consumption by eliminating the separate frame buffer memory, and saves real estate on the mainboard enabling thinner lighter form factors.

- **Supports Intel Speedstep™ and VIA LongHaul™**: The VIA ProSavageDDR PN266T supports dynamic power managemnt technologies including Intel SpeedStep™ and VIA LongHaul™.

- **High-Speed V-Link Hub Architecture**: The VIA ProSavageDDR PN266T makes use of VIA's V-Link Hub Architecture, which provides a dedicated 266MB/s bus between the north and south bridge. Less advanced chipsets use the 132MB/s PCI bus as a link, which must be shared with all PCI peripherals.

- **V-MAP:** Based on the unique VIA Modular Architecture Platform (V-MAP), the VIA ProSavageDDR PN266T provides OEMs and SIs with unparalleled flexibility and scalability for existing and future PC designs. A choice of VT8233 series V-link South Bridges is available on the platform with differing feature sets enabling OEMs and SIs to target system designs at specific segments of the marketplace without the expense of developing new mainboard platforms.

Integrated Graphics in Mobile Systems

The VIA ProSavageDDR PN266T with the S3 Graphics ProSavage8™ core integrated into the North Bridge offers significant advantages over discrete graphics solutions in the mobile marketplace.

Integration reduces system cost: Integrated graphics allow OEMs and System Integrators to eliminate an external graphics card from the cost of a VIA ProSavage based system while maintaining competitive 2D and 3D performance.

ProSavage8™ Graphics Performance: With effective AGP 8X, up to 32MB of frame buffer and DVD motion compensation the ProSavage8™ provides stunning video quality and performance.

Saves Real Estate on the Mainboard: Enables thinner lighter designs with lower power consumption due to elimination of the dedicated frame buffer memory (SMA chipsets use the system memory for frame buffer) and the lower transistor count.

ProSavage Driver Set: S3 Graphics ProSavageDDR chipsets have a mature and comprehensive unified driver set, minimizing compatibility issues and reducing deployment risk for corporate customers.

Key Features include:

- 128-bit 2D/3D Graphics Accelerator
- Effective AGP 8X internal bandwidth (2.1GB/s transfer rate)
- 8M triangles/s
- 32-bit Rendering, Bump Mapping, Vertex and Table fog
- Reflection Mapping, shadows and atmospheric effects
- S3TC Texture Compression
- DSTN and LVDS LCD Support
- 8KByte Texture Cache
- DVD Motion Compensation 30fps
- AGP 4X Sideband Addressing

DDR SDRAM Overview

DDR SDRAM technology is the result of an industry-wide collaboration to develop the next generation memory standard. It is designed to provide a high performance, high value upgrade path from previous PC133 technology. As the driving force behind PC133, VIA Technologies has embraced DDR, and currently offers the widest range of DDR chipsets for the Intel® Pentium® III, AMD Athlon™ XP, and Intel® Pentium® 4 processor platforms.

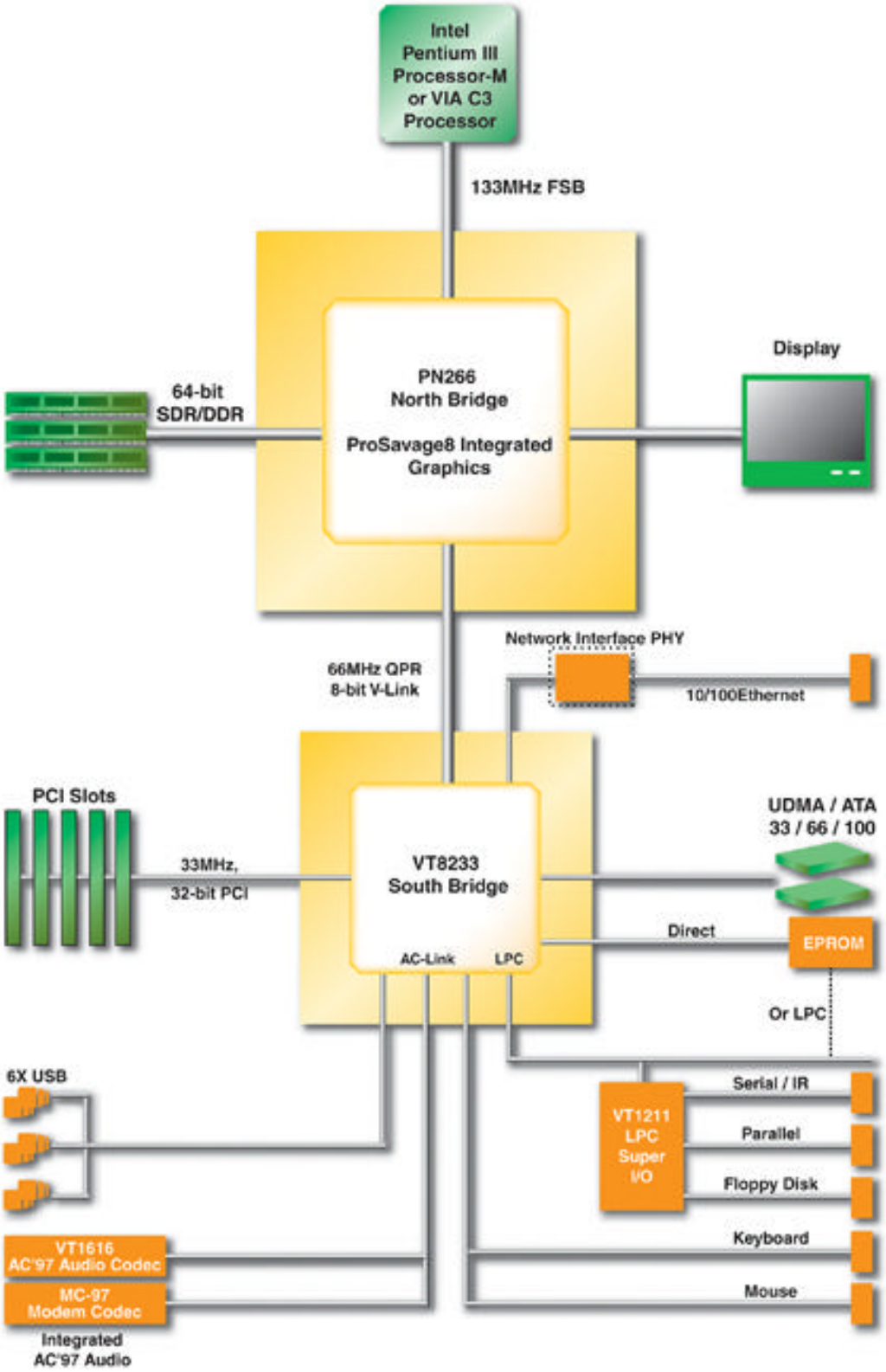
Available in two different speed grades, DDR enables memory performance to be scaled to fit the performance and cost requirements of a given platform. DDR200 (also known as PC1600) runs at a 100MHz clock speed, and transfers data on both the rising and falling edges of the clock for an effective 200MHz clock rate. DDR266 (or PC2100) uses the same clock doubling technology, but runs at a 133MHz core speed, for an effective 266MHz clock rate.

With this clock doubling technology, DDR200 is able to transfer up to 1.6GB/s, and DDR266 a staggering 2.1GB/s. Also, due to its evolutionary, parallel technology, the latency of DDR is quite low compared to competing serial memory technologies.

All grades of DDR SDRAM operate at 2.5 volts, as opposed to 3.3V for PC100 and PC133. This lowered voltage allows DDR to penetrate power sensitive applications, such as notebooks and 1U servers. Lowered power consumption translates directly to lowered heat dissipation, again increasing the effectiveness of DDR in mobile and server applications.

DDR SDRAM leverages the existing PC133 manufacturing infrastructure, allowing manufacturers to produce DDR266 memory for roughly the same cost as PC133. This price parity with SDRAM will rapidly drive the adoption of DDR as memory bandwidth limitations become more constricting.

VIA ProSavageDDR PN266T Product Overview



The VIA ProSavageDDR PN266T consists of two separate chips: The 552-pin VT8613 Integrated North Bridge, and a 376-pin VT8233 Series V-Link South Bridge. Both use standard PGA packaging to reduce the cost of production and allow the use of standard heatsink solutions.

VIA ProSavage PN266T North Bridge

The North Bridge of the VIA ProSavageDDR PN266T (model number VT8613) provides support for a 100/133MHz Front Side Bus. Deep pipelining and buffering keep the high-speed system bus supplied with a constant stream of data, maximizing the performance of the processor. This system bus runs in pseudo-synchronous operation with the memory and AGP controllers, providing the low latency of a synchronous design without sacrificing the flexibility of an asynchronous implementation.

The VT8613 integrates the ProSavage8™ graphics core into the North Bridge offering competitive 2D/3D performance, and eliminating the need for a separate graphics card on the mainboard.

The VT8613 North Bridge of the VIA ProSavageDDR PN266T has a flexible memory controller that supports up to 4GB of DDR200/DDR266 SDRAM. Virtual Channel Memory and Error Correcting Code (ECC) memory are also supported, as is PC100 and PC133 SDRAM. With such flexible memory support, the VIA ProSavageDDR PN266T gives OEMs and SIs maximum scalability to allow the construction of a full spectrum of systems reaching different performance and cost levels from mainstream consumer and commercial notebooks to high-end desktop replacements.

VIA Modular Architecture Platform (V-MAP) South Bridge Options.

The VIA ProSavageDDR PN266T can be configured with a choice of V-MAP pin compatible South Bridge Solutions, all with a 266MB per second V-link interface connecting them to the North Bridge. The VT8233 Series offers flexibility to OEMs and System Integrators when building systems matched to different market segments

VT8233 and VT8233C

The VT8233 and VT8233C are highly integrated network-ready South Bridges that feature two high-speed ATA-100 IDE controllers (4 IDE devices total), 6 PCI slots, Low Pin Count (LPC) interface, and an I/O Advanced Programmable Interrupt Controller (APIC). Advanced Configuration and Power Interface (ACPI) and Advanced Power Management (APM) are also integrated into all VT8233 family products. The VT8233C adds an integrated 3Com® Ethernet MAC controller, providing high quality and ultra reliable 10/100 Mbps network support. The VT8233 uses VIA integrated 10/100 Ethernet and HomePNA.

The three USB hubs offering a combined 36 Mbps of bandwidth for the VT8233 and VT8233C provide additional flexibility by allowing the user to add up to six USB devices to the system, such as keyboards, mice, drives, digital cameras, scanners, speakers, modems, joysticks, and MP3 players.

All VIA V-Link South Bridges feature high quality, 6 channel AC/97 2.2 sound support, as well as an MC/97 software modem interface.

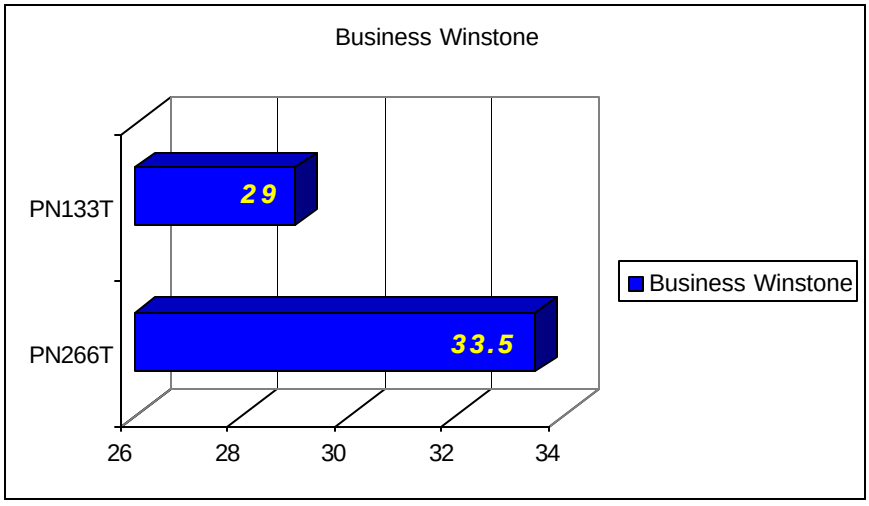
The enhanced IDE controllers on the VT8233 and VT8233C support all Ultra-DMA 33/66/100 devices including as CD-ROMs, DVD-ROMs, and hard disk drives. ATA-100 is the fastest mainstream IDE standard, and allows each separate IDE controller on the VT8233 and VT8233C to burst up to 100MB/s, for a total of 200MB/s of bandwidth. Each controller also supports up to two devices, for a total of four ATA-100 capable drives.

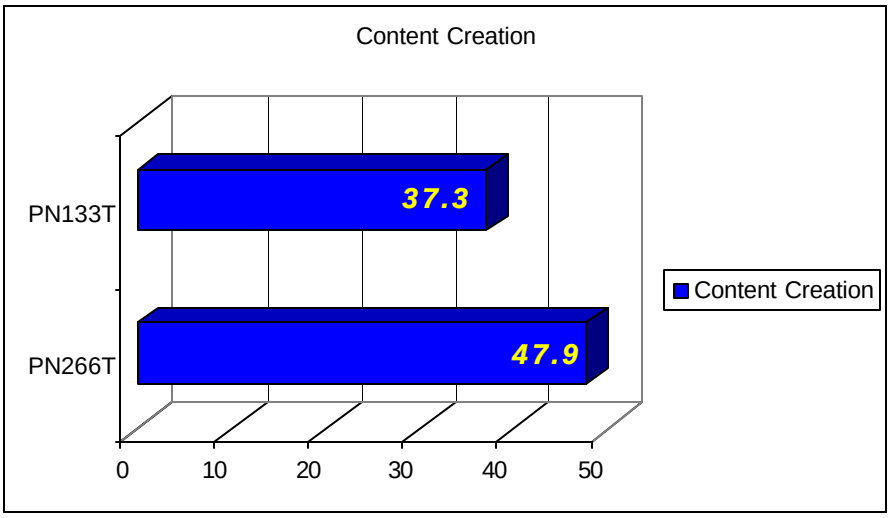
VT8233	**VT8233C**
V-Link South Bridge AC/97 audio, MC'97 Modem 6 ports USB VIA MAC with MII Interface Home PNA, 10/100 BT w/ Ext. PHY Dual UDMA 33/66/100, LPC Super IO/APIC Adv. Power Management	V-Link South Bridge AC/97 audio, MC'97 Modem 6 ports USB 3Com® 10/100 Ethernet MAC Dual UDMA 33/66 100, LPC Super IO/APIC Adv. Power Management 3com

VIA ProSavageDDR PN266T Performance Highlights

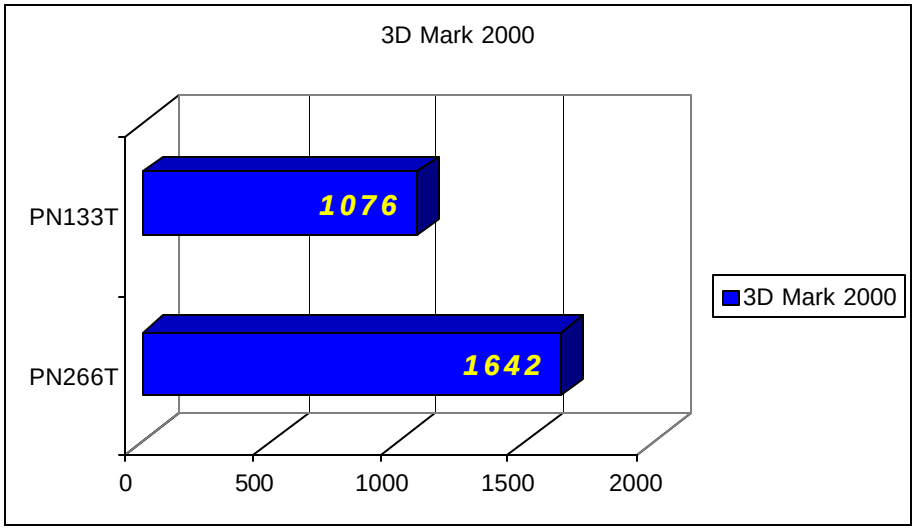
The VIA ProSavageDDR PN266T exploits the speed of DDR266 SDRAM memory to extract maximum performance from Intel® Pentium® III Processor-M based systems. By doubling memory bandwidth over current PC133 based designs, DDR reduces the time the CPU takes to access the system memory and thus increases the number of tasks completed in a fixed time period. DDR memory also increases data throughput in the 128-bit S3 Graphics ProSavage8™ graphics accelerator delivering the best integrated graphics performance available from a mobile chipset. In the most commonly used applications this yields performance comparable with the fastest desktop systems, and up to 60% more efficient than PC133 based mobile chipsets.

In Business Winstone 2001 and Content Creation Winstone 2001 the VIA ProSavageDDR PN266T outperforms the VIA ProSavage PN133 by between 15% and 25% offering a genuine increase productivity, thus saving battery time per task.





In 3D applications the performance benefits of DDR are even more marked with a more than 50% Improvement in 3D Mark 2000.



Conclusion: Mobile Performance Without Compromise

The VIA ProSavageDDR PN266T with DDR266 SDRAM redefines performance and power consumption in mobile systems. The twin benefits of double the memory bandwidth and 30% lower voltage from DDR combined with the Intel Pentium III Processor-M deliver system performance equivalent to the latest desktop PCs. ProSavage8™ graphics and V-MAP South Bridge options, showcasing the latest communication and networking technology, enable high performance mobile systems in stylish and convenient form factors, at price points competitive with competing PC133 based platforms.

Appendix

The reference systems were based on the following configurations:

Chipset	VIA ProSavageDDR PN266T	VIA ProSavage PN133T
Processor	Intel Pentium III Processor-M 1.0GHz	Intel Pentium III Processor-M 1.0GHz
Memory	256MB DDR266	256MB PC133
Graphics	Integrated S3 Graphics ProSavage8™	Integrated S3 Graphics ProSavage4™
HDD	IBM 307030 40GB ATA-100	IBM 307030 40GB ATA-100
Operating System	Windows XP	Windows XP