Date: August 01, 1997
Type: Motherboards Chipsets: VIA MVP3
Author: Anand Lal Shimpi

With ALi boasting support for the 100MHz Frontside Bus and a large cacheable memory area, how could VIA resist but to release a Super7 candidate of their own? Originally, the VIA VP3 was expected to be the very first 100MHz + Socket-7 + AGP motherboard, unfortunately VIA dropped a bombshell on the market by announcing that the VP3 wouldn't support any bus speeds greater than 66MHz. At the same time VIA hinted at a Mobile-VP3 chipset, the MVP3, that would actually support the 100MHz bus speed & AGP. Now, under a year later, the MVP3 chipset is almost ready to make its grand-entrance, how grand will it be? We can only speculate.

In spite of the name, the Mobile VP3 can be used in both Desktop and Mobile motherboard solutions, this versatility will prove to be beneficial for VIA since no other chipset manufacturer has a chipset that will officially run the 100MHz on a Notebook system. In the desktop arena, the MVP3 will definitely be a competitor to the Aladdin V by ALi, with both chipsets supporting all of the features the Intel TX chipset does adding support for a 100MHz Frontside bus, as well as AGP 2x support. The MVP3 differs from the Aladdin V in two major areas, both involving RAM...let's explore the two differences.

While the Aladdin V only supports EDO, FPM, and SDRAM, the MVP3 supports JEDEC BDDR SDRAM-II (Bi Directional Double Data Rate SDRAM), Virtual Channel SDRAM, and Enhanced SDRAM. While those last few SDRAM types are next to impossible to come across that may change if the demand for SDRAM-II modules increases, possibly by the success of a chipset that supports the standard. Its a heavy weight to put on the MVP3's unreleased shoulders, but it is there nevertheless.

Speaking of RAM, the MVP3 chipset introduces a unique feature into the Super7 arena, the ability to run the Memory Bus Speed at 66MHz, while using a 100MHz Bus Speed to derive the Processor Clock. This means that, in theory, you could even re-use your old generic 60ns EDO SIMMs on a MVP3 motherboard. Not a bad feature for VIA to include.

The only other real difference between the MVP3 and the Aladdin V is that the MVP3 doesn't feature any Internal L2 cache bits/Tag RAM bits, making high quality L2 cache with a fast Tag RAM chip a necessity for all MVP3 boards if you plan on using them with the 100MHz bus speed. This introduces a new factor into achieving system stability, L2 cache quality, if a manufacturer of a MVP3 motherboard decides to skimp on the L2 cache and include 8 or even 10ns SRAM chips, expect to have problems galore at 100MHz.

An interesting note, unlike all previous VIA Socket-7 chipsets, the MVP3 only features an integrated 8-bit Tag comparator while the VP2 for example features an integrated 10-bit Tag comparator. Translation? Don't expect MVP3 motherboards to be able to cache the supported 1GB of RAM, in combination with the L2 cache sizes and Tag RAM chips that will be used on most MVP3 motherboards, expect cacheable memory areas to range from 256MB down to 64MB. While waiting for an official word from VIA on this issue, it seems highly unlikely that MVP3 motherboards will be able to compete with Aladdin V boards in terms of cacheable memory areas.

Performance wise, in spite of the fewer CPU-to-DRAM write buffers, the MVP3 should be on the heels of the Aladdin V, outperforming the Intel TX chipset at the 66MHz bus speed and leaving it behind when clocked at 100MHz.

VIA has been in the lime light of the chipset industry for much longer than Acer Labs has, so it'll take quite a bit for VIA to throw in the towel in the Super7 battle. Expect the MVP3 to be the Aladdin V's biggest competitor, in the end it will most likely come down to a battle among motherboard manufacturers to completely harness the immense power of one of these two chipsets.

VIA VT82C Apollo Mobile VP3 Chipset		
Common Name		Apollo MVP3
Chipset Packaging	Number of chips	2 (VT82C598AT System Controller, VT82C586B PCI-to-ISA Bridge)
	Packaging Type	1 x 476-pin BGA; 1 x 208-pin QFP
CPU Support	Number of CPUs	1
	AMD CPUs Supported	K5, K6, K6-3D
	Cyrix CPUs Supported	6x86 (M1), 6x86MX (M2) w/ Linear Burst Mode Support
	Intel CPUs Supported	Pentium, Pentium MMX
Cache	Type	Synchronous Pipeline Burst Cache
	Maximum Supported Size	2048KB
	Maximum Cacheable DRAM Area	???
Memory	Maximum DRAM Supported	1GB
	BEDO DRAM Read Timings (66MHz)	N/A
	EDO DRAM Read Timings (66MHz)	5-2-2-2
	FPM DRAM Read Timings (66MHz)	5-3-3-3
	SDRAM Read Timings (66MHz)	3-1-1-1
	Data Path to Memory	64-bits
	ECC Support	Yes
Hard Disk Controller	Chip	VIA BMIDE Controller (VT82C586B)
	Busmastering Support	Yes
	UltraDMA Support	Yes
	Max. Theoretical Transfer Rate	PIO Mode 5/DMA Mode 3 (33.3MB/S)
PCI Interface	Supported PCI Bus Speeds	25, 30, 33 MHz
	Concurrent PCI	Yes
	Async. PCI Bus Speed	Yes (Pseudo Synchronous)
	PCI Specification	2.1 (66 MHz max.)
Power Management	PC97 Compliance	Yes
	Suspend to Disk	Yes
	HDD Power Down	Yes
	Modem Wakeup	Yes
	System Suspend	Yes
Video	AGP Support	Yes
	Unified Memory Architecture	No
Peripheral Support	USB Support	Yes
	Plug and Play Port	Yes
Write Buffers	CPU-to-DRAM	16 QWords
	CPU-to-PCI	5 DWords
	PCI-to-DRAM	48 DWords
Officially Supported Bus Speeds		50, 60, 66, 75, 83, 100 MHz
Unofficially Achieved Bus Speeds		Unknown

Date: August 01, 1997
Type: Motherboards Chipsets: ALi Aladdin V
Author: Anand Lal Shimpi

When AMD announced that they were looking for a candidate for the "official" Super7 Chipset (Socket-7 + AGP + 100MHz Frontside Bus) the market never expected Acer Labs (ALi) to be a viable candidate. Originally best known for their low cost Aladdin IV chipset found in most PC Chips motherboards, ALi was never much of a contender in the Chipset Industry taking a back seat to the duel of Intel and VIA. For once, the Socket-7 Chipset Market is the platform for a 4-way war of chipsets between Intel's 430TX, VIA's VP3 (and MVP3), SiS' 5591, and now, ALi's Aladdin V. What makes the Aladdin V so special? Quite a few things.

First of all, the Aladdin V meets all of the requirements to be a Super7 chipset, it supports the Accelerated Graphics Port, all current Socket-7 processors including AMD's upcoming K6-3D, and, the most sought after feature in a Socket-7 chipset, support for a 100MHz Frontside Bus. A combination of meeting these requirements, the extremely large cacheable memory area of the chipset, and a feature-set that puts Intel's TX Chipset to shame makes the Aladdin V chipset appear to be the king of the Socket-7 arena...or at least a contender for the throne.

The Aladdin V, in theory can accept up to 1GB of RAM, all cacheable. Doing so would put outstanding amounts of stress on the Bus, especially when using the 100MHz bus speed, so expect Aladdin V motherboards to feature no more than 3 DIMM slots. One of the most important features the Aladdin V chipset boasts is the internal L2 cache the chipset features, more specifically the M1541 chip has an integrated 16K x 10-bit Tag RAM as well as 16K x 2 L2 cache SRAM, both of which decrease cost and increase performance somewhat. The most important reason for including the Tag RAM on chip is to make using the 100MHz bus speed possible. The 100MHz Bus Frequency puts a heavy strain on the L2 cache, and tests have shown that without fast L2 cache & a capable Tag RAM chip (6ns or faster) the 100MHz bus speed has the potential to become quite erratic. By placing the Tag RAM on the chipset ALi eliminates the possibility of the L2 cache or chipset as being the limiting factor in making use of the 100MHz bus speed. Leaving your CPU, and Memory since the Aladdin V supports a Pseudo Synchronous PCI/AGP Bus to keep the PCI bus speed at or around the 33MHz marker, and the AGP bus at or around the 66MHz point.

The deep buffers between the CPU and DRAM interfaces should keep performance of the Aladdin V on par with or above that of all Socket-7 motherboards based on Intel chipsets, using the 100MHz bus speed the Aladdin V should be able to remove the Intel TX chipset from the picture as a possible competitor when dealing with performance.

UltraDMA, PC97 Compliance, and Advanced Power Management support are among the now standard features that ALi brings to the table with their Aladdin V, making it a very promising chipset...shortly you'll begin to see the first Aladdin V motherboards make their way into the mainstream market, then we can truly decide whether or not this chipset lives up to the hype.

ALi Aladdin V Chipset		
Common Name		Aladdin V
Chipset Packaging	Number of chips	2 (M1541 & M1543)
	Packaging Type	1 x 456-pin BGA (M1541), 1 x 328-pin BGA (M1543)
CPU Support	Number of CPUs	1
	AMD CPUs Supported	K5, K6, K6-3D
	Cyrix CPUs Supported	6x86 (M1), 6x86MX (M2)
	Intel CPUs Supported	Pentium, Pentium MMX
Cache	Type	Synchronous Pipeline Burst Cache
	Maximum Supported Size	1024KB
	Maximum Cacheable DRAM Area	512MB (10-bit Tag RAM - 512KB L2) 1GB (256KB L2)
Memory	Maximum DRAM Supported	1GB (8 RAS Lines)
	BEDO DRAM Read Timings (66MHz)	N/A
	EDO DRAM Read Timings (66MHz)	5-2-2-2
	FPM DRAM Read Timings (66MHz)	5-3-3-3
	SDRAM Read Timings (66MHz)	3-1-1-1
	Data Path to Memory	64-bits
	ECC Support	Yes
Hard Disk Controller	Chip	M1543
	Busmastering Support	Yes
	UltraDMA Support	Yes
	Max. Theoretical Transfer Rate	PIO Mode 5/DMA Mode 3 (33.3MB/S)
PCI Interface	Supported PCI Bus Speeds	25, 30, 33 MHz
	Concurrent PCI	Yes
	Async. PCI Bus Speed	Yes (Pseudo Synchronous)
	PCI Specification	2.1 (66 MHz max.)
Power Management	PC97 Compliance	Yes
	Suspend to Disk	Yes
	HDD Power Down	Yes
	Modem Wakeup	Yes
	System Suspend	Yes
Video	AGP Support	Yes
	Unified Memory Architecture	No
Peripheral Support	USB Support	Yes
	Plug and Play Port	Yes
Write Buffers	CPU-to-DRAM	32 QWords
	CPU-to-PCI	6 DWords
	PCI-to-DRAM	48 DWords
Officially Supported Bus Speeds		50, 60, 66, 75, 83, 100 MHz
Unofficially Achieved Bus Speeds		Unknown

Date: August 01, 1997
Type: Motherboards Chipsets: Intel 430TX
Author: Charles M. Kozierok.

With the 430HX chipset primarily the choice of those seeking high performance, Intel's announcement of a new chipset to be delivered to market in early 1997 had everyone hoping that the 430TX would be the "next step" forward, something to combine the benefits of the 430HX with new capabilities and position itself as the obvious winner for some time to come.

Instead, Intel delivered what seems to be much more a successor to the 430VX than the 430HX, which disappointed many people. It incorporates several new technologies, and improves performance over the VX chipset, but it leaves out several capabilities of the HX. The reason for this, in part, may be Intel's supposed desire to move high-end users from the Pentium family of processors to the Pentium Pro and Pentium II. Having no clear "do it all" chipset for the Pentium may be part of this strategy (it certainly makes sense to *me* from a business standpoint). One point in favor of this argument is Intel's decision not to support AGP with the 430TX, as had been originally anticipated.

Note: Some people like to call the 430TX "Triton IV" since it is the fourth in the "430" family of chipsets. I am quite sure that Intel has never called it that, so I do not.

The end result of all this is that instead of the 430TX being an obvious best of the Pentium chipsets, an "HX vs. TX" choice was set up. This is much more of a tradeoff than the HX vs. VX choice was (basically, the HX was clearly superior to the VX unless cost or SDRAM support were major concerns.) Here's how the 430TX chipset compares against its most recent predecessors.

The TX chipset's primary advantages over the VX:

- Improved memory timing for initial read from SDRAM; 5-1-1-1 instead of 7-1-1-1.
- Increased maximum memory, from 128 MB to 256 (but *cacheable memory remains at only 64 MB*).
- Support for more SIMM and DIMM slots on the motherboard than the VX provides.
- Support for Ultra DMA transfers, allowing faster transfer rates on high-end drives.
- Independent device timing for IDE/ATA devices.
- Lower power consumption.
- Better performance overall.

The TX chipset's disadvantages compared to the VX:

- None really, except that it will be more expensive because it is newer and better.

So, the TX vs. VX question is pretty much a "no brainer": the TX is better, and the VX is cheaper, and that's the decision, performance vs. cost.

Against the HX we have a bit more of a contest. Here are the TX's main advantages over the HX chipset:

- Support for SDRAM.
- Superior memory timing when using SDRAM, with no trade-off for the initial read: 5-1-1-1 vs. 5-2-2-2 (for HX's EDO) as opposed to the VX's 7-1-1-1.
- Support for DMA mode 3 transfers (a.k.a. DMA-33, Ultra-ATA, or ATA-33), allowing faster transfer rates on high-end drives.
- Lower power consumption.

The TX's disadvantages compared to the HX are:

- No parity or ECC memory support.
- No dual processor support.
- Support for only 256 MB of system memory, instead of 512 MB.
- Support for only 64 MB of cached system memory, still!
- Fewer PCI I/O buffers (but more than the VX).
- Fewer motherboard SIMM/DIMM slots (but again, more than the VX).

This chipset obviously compares much better against the HX than the VX does, although it still has some glaring weaknesses, particularly the low DRAM cacheability, and no error correction support. (I'm in the minority but I do not use unprotected memory and that's that.)

For most of the first year since its introduction, the TX chipset was fairly successful, but really did not replace the HX chipset. The market was pretty much split between the two. Now, the TX is by far the most common new Intel chipset for the Pentium platform. Why? Simple: Intel *discontinued* the HX chipset. The TX is the last Intel chipset for fifth generation motherboards. The future appears to belong to alternative chipset makers such as VIA Technologies.

Warning: Beware the so-called "TX Pro" chipset, which is not the 430TX but a cheaper imitator trying to confuse the buying public by making it sound like it is superior to the 430TX. It is in fact not made by Intel but by another chipset vendor that doesn't seem to have enough faith in its product to use its own name.

Intel has been by far the most popular choice for Pentium motherboard chipsets; more than 90% of Pentium motherboards in existence use Intel chipsets. The 430FX, 430HX, 430VX and 430TX are similar in name and function. The table below contrasts these chipsets in order to demonstrate their most important features and performance factors. The topic headers are based on the topics in the Chipset Functions and Features section. These chipsets all support the Pentium and socket-compatible processors, and use PCI and ISA I/O buses.

Note: The TX chipset is listed before the HX instead of after it, to permit easier comparison to the HX and VX chipsets.

Group	Characteristic	Intel 430FX	Intel 430VX	Intel 430TX	Intel 430HX
Summary Information	**Target Market**	All	Home / General	Home / General	Business / High-End
	Introduced	Early 1995	Early 1996	Early 1997	Early 1996
	Relative Cost	Lower	Moderate	Higher	Higher
Processor	**System Bus Speeds**	50, 60, 66 MHz	50, 60, 66 MHz	50, 60, 66 MHz	50, 60, 66 MHz
	Processor Multipliers	1.5x, 2x, 2.5x, 3x	1.5x, 2x, 2.5x, 3x	1.5x, 2x, 2.5x, 3x	1.5x, 2x, 2.5x, 3x
	Maximum # of Processors	Single	Single	Single	**Dual**
L2 Cache	**Cache Types**	Async, Sync Burst, Pipelined Burst	Async, Sync Burst, Pipelined Burst	Pipelined Burst	Pipelined Burst
	Max Cache Size	512 KB	512 KB	512 KB	512 KB
	Max RAM Cacheable	64 MB	64 MB	64 MB	**512 MB w/ Tag RAM**
Memory	**Max RAM Support**	128 MB	128 MB	256 MB	**512 MB**
	DRAM Technology	FPM, EDO	**FPM, EDO, SDRAM**	**FPM, EDO, SDRAM**	FPM, EDO
	DRAM Packaging	SIMM	**SIMM, DIMM**	**SIMM, DIMM**	**SIMM, DIMM**
	Maximum # of SIMMs/DIMMs	4 / 2	4 / 2	6 / 3	**8 / 4**
	Parity/ECC Support	Neither	Neither	Neither	**Both**
System Timing	**L2 Cache Read Timing**	3-1-1-1	3-1-1-1	3-1-1-1	3-1-1-1
	FPM DRAM Read Timing (60/66 MHz)	7-3-3-3 / 7-3-3-3	5-3-3-3 / 6-3-3-3	**4-3-3-3 / 5-3-3-3**	**4-3-3-3 / 5-3-3-3**
	EDO DRAM Read Timing (60/66 MHz)	7-2-2-2 / 7-2-2-2	5-2-2-2 / 6-2-2-2	**4-2-2-2 / 5-2-2-2**	**4-2-2-2 / 5-2-2-2**
	BEDO/SDRAM Read Timing (60/66 MHz)	n/a	6-1-1-1 / 7-1-1-1	**5-1-1-1 / 5-1-1-1**	n/a
	Processor to PCI Buffers	4	5	!?	**6**
	PCI to Memory Buffers	12	18 + 10	18 + 10	**20 + 22**

	Characteristic	Intel 430FX	Intel 430VX	Intel 430TX	Intel 430HX
	Memory Autodetect	Yes	Yes	Yes	Yes
Peripheral and I/O Bus	**PCI Bus Standard**	2.0	**2.1**	**2.1**	**2.1**
	IDE/ATA Channels	2	2	2	2
	Fastest PIO Mode	4	4	4	4
	Fastest DMA Mode	2	2	**3 (DMA-33)**	2
	Independent Device Timing	No	No	**Yes**	**Yes**
	PCI Bus Mastering	Yes	Yes	Yes	Yes
	USB Support	No	**Yes**	**Yes**	**Yes**
	AGP Support	No	No	No	No
	Plug and Play Compliant	Yes	Yes	Yes	Yes
Power Mgmt.	**APM Compliant**	Yes	Yes	Yes	Yes

Note: System timings stated are "optimal" and depend on support from appropriately fast memory. Otherwise you may need to slow down the timing in your BIOS setup. See the section on memory system timing for more details.