ABIT NV8 the Sempron's Best Friend

ABIT NV8 Intro

The ABIT brand of motherboards is very well-known for massive overclockability. And as they are aimed squarely at the middle to high end DIY market, they naturally don't come cheap. The market, however, needs products from all segments, starting from affordable entry-level to pricey feature-rich high-end. For more price-sensitive users, there are also high price-performance items such as this ABIT NV8 motherboard.

Found at Newegg.com at a price below \$80, this Abit motherboard represents an immense value as we don't detect any discounts in functionality or quality. And that makes it the Socket 754 processor's best friend and really good news for users who are currently contemplating building a Sempron (Socket 754) system. These users want price and respectable levels of performance, and this motherboard has got both.

As we already know, there isn't really an obvious performance gap between the Socket 754 and Socket 939 Athlon 64 processors. This motherboard can therefore be used to erect a high-performance Athlon 64 computing platform. As such, it isn't entirely fair to call the Socket 754 a low-mid-range choice. With ABIT's industry-leading overclocking technologies, this motherboard can therefore be used to erect a high-performance Athlon 64 computing platform.



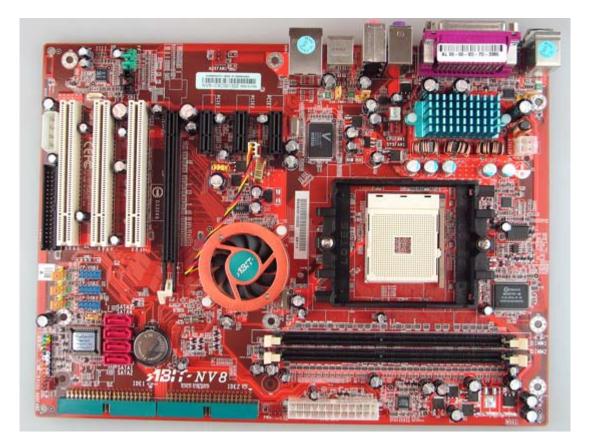
The above is an officially-supplied shot of the NV8 motherboard.



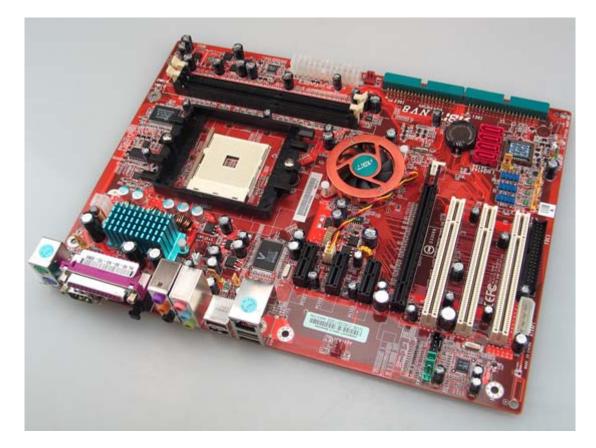


This motherboard is packed for the price. It comes with 4 SATA data cables and a USB expansion bracket (with two USB ports). It doesn't get much better than this for the asking price.

Specifications

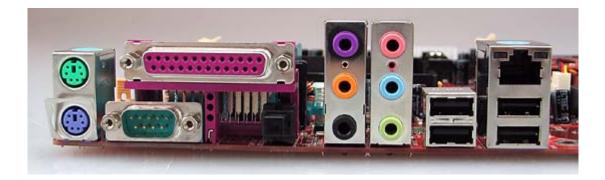


Like many other nForce4-4x motherboards, the Socket 754 ABIT NV8 motherboard supports the Socket 754 Athlon 64 and Sempron processors. As we see in the image above, this motherboard is designed to take into account the majority of requirements out there. This motherboard has seven expansion slots (1 PCI Express x16 graphics card slot, 3 PCI Express x1 and three PCI slots) and 4 SATA ports with RAID support as well as 2 PATA pots.

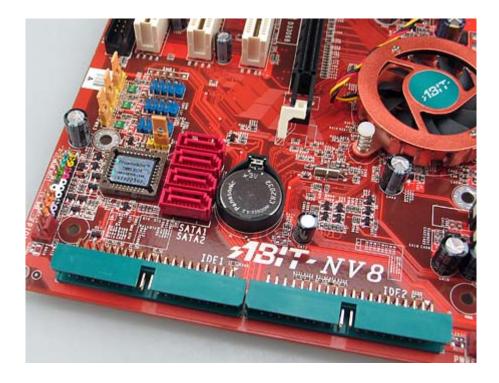


ABIT NV8 Specifications				
Chipset nForce4-4x				
CPU support	AMD Athlon 64/Sempron (Socket 754)			
	HyperTransport: 800MHz			
Memory support	DIMMx2			
	Single channel DDR400			
Graphics interface	1 PCI Express x16 slot			
IDE	Ultra ATA/133x2			
	SATA x4 (RAID 0/1/0+1)			
LAN	nForce4 built-in Gigabyte MAC with external Vitesse PHY			
Sound	Onboard Realtek ALC850 7.1 channel Codec			
Expansion slots (non	3 x PCI Express x1			
graphics)	3 x PCI			
USB	USB2.0 x10 (6 motherboard headers)			

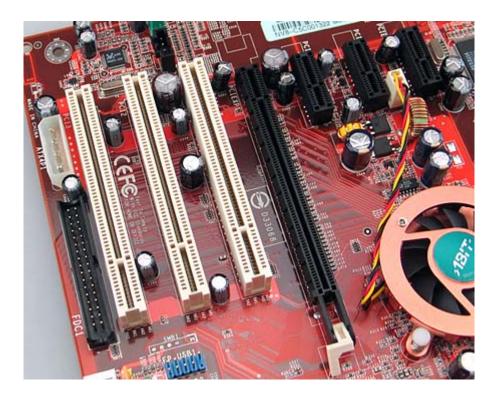
Close Ups: Rear IO Panel, SATA Port. Expansion Slots



Being a non-high-end product, the NV8 is surprisingly well-equipped with a RJ45 Gigabit Ethernet port and FireWire, though it doesn't provide dual Gigabit Ethernet ports. The rear IO panel is at once both feature-rich and practical with the indispensable PS/2 and USB ports, plus 7.1 channel audio output ports and an S/PDIF output port.



The motherboard's jumpers use the convenient classic ABIT lengthened design. In addition, the chipset cooler is molded from copper, which is excellent news for any member of the nForce4 family which often produce considerable heat.



ABIT provides an auxiliary power connector for the PCI Express x16 graphics cards. The sheer number of expansion slots on the NV8 is really quite rare among entry to mid-range motherboards. There are three PCI x1 slots and three PCI slots in addition to the graphics card slot.

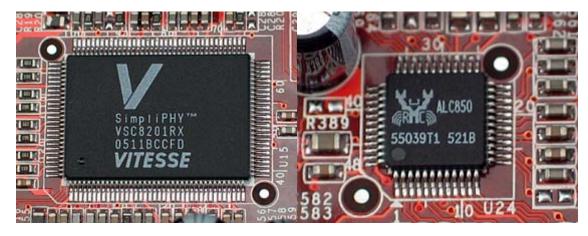
Close Ups: MCP and Onboard Devices



As we are quite aware of by now, many of the earlier nForce4-4x MCPs were actually "A2 edition" nForce4 products that were unable to work stably at 1GHz HT bus speed. This caused engineers to retard HT to 800MHz. The A2 were limited in number, and ours is actually the A3 edition nForce4 MCP that is able to operate at 1GHz HT bus speed.

🗢 CPU	-Z							
CPU	Cache	Mainbo	ard	Memory	SPD	Ab	out	
Mother	board -							
Manufa	cturer	http://ww	vw.	abit.com.t	w/			
	Model	NV8(NF-	СК8	04)				1.x
0	hipset	nVidia	a		nForc	e4		Rev. A3
South	bridge	nVidia	a		nForce4	MCP		
s	Sensor	Winbor	nd		W8362	7HF		
-BIOS -								
в	rand	Phoenix T	echr	nologies, l	TD			
Ver	rsion 🛛	6.00 PG						
	Date	07/01/200	5					
Graphi	c Interf:	ace —						
	\ \	/ersion			PCI-	Expre	88	
	Linł	< Width		x16	Max	k. Sup	ported	x16
	Apertu	re Size						
	Sid	e Band						
L								
							,	Version 1.30
CPU	-Z							OK

CPU-Z v1.30 also detects the A3 edition MCP

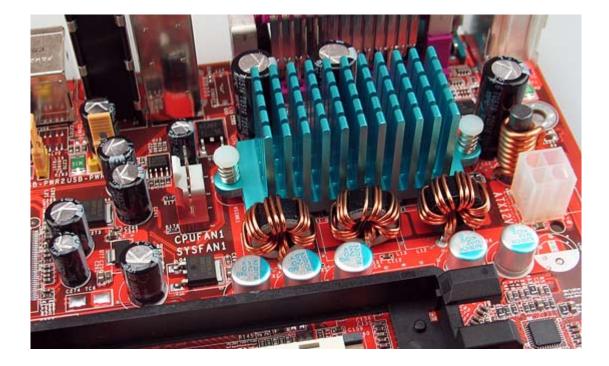


Vitesse VSC8201 Gigabit Ethernet PHY

Realtek ALC850 AC'97 Codec

This motherboard's Gigabit Ethernet ports are provided courtesy of the nForce4-4x's integrated MAC controller and the Vitesse VSC8201 PHY. This combination is used to provide full-duplex Gigabit Ethernet, and support for the NVIDIA firewall feature (the standard nForce4 and the -4x edition do not have the hardware security engine). Overall This motherboard has very strong networking features. ALC850 is adopted as the audio codec, which is very common among

nForce4 motherboards. ABIT doesn't used lower grade ALC650 chip.



Close Ups: CPU power supply area and PCB tin stripes

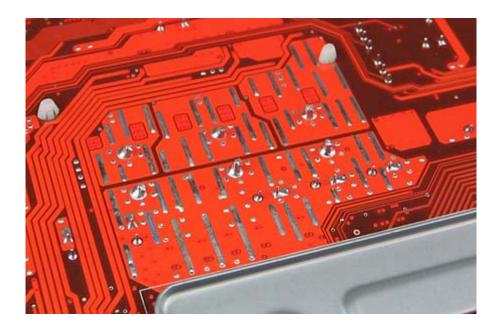
The NV8's CPU power supply is quite lavishly made with solid aluminum capacitors and MOSFET heatspeaders– something found rarely on bargain price motherboards.



The above is a shot with the MOSFET heatspeaders removed. This 3-phase design uses 6 MOSFETs in all. Though each MOSFET will operate hotter, they can rely on the heatspeaders for added heat dissipation.



The NV8 uses only Japanese made capacitors, and most of them come from Rubycon. Praiseworthy indeed for such a humbly-priced product.



At the back of the motherboard are tin stripes used to aid cooling of the PCB. This a quite popular design today, and it definitely helps.

BIOS(1)

BIOS version: 1.0



Boot up screen

h	ntegrated Peripherals	PC Health Status				
 OnChip IDE/RAID Function Init Display First OnChip USB USB Keyboard Support USB Mouse Support OnChip Audio Controller OnChip LAN Controller Onboard LAM Boot ROM Onboard FDD Controller Onboard Serial Port Onboard Parallel Port × - Parallel Port Mode × EPP Mode Select × - ECP Mode Use DMA 	Press Enter PCIe U1.1+U2.0 Disabled Disabled Disabled Disabled Disabled Disabled Disabled SPP EPP1.7 3	FAN Fail Alarm Selectable Shutdown When FAN Fail CPU FanEQ Speed Control - CPU FanEQ Speed Control Shutdown Temperature CPU Harning Temperature CPU Temperature System Temperature CPU FAN Speed NB FAN Speed NB FAN Speed SYS FAN Speed CPU Core Voltage DDB Voltage ATX +3.30 ATX +50 ATX +120 CK804 CORE Voltage Hyper Transport Voltage +30 Dual	Disabled Disabled 66% Speed r 55 Disabled 43°C/109°F 36°C/ 96°F 3013 RPM 4963 RPM 0 RPM 1.66 U 2.84 U 3.34 U 5.18 U 11.18 U 1.71 U 1.37 U 3.21 U			

Integrated Peripherals

System monitor

The Integrated Peripherals options are rich and complete with every onboard device being

accounted for. In the above right image we see that ABIT has provided a fan-speed control function to allow the user to have a greater hand in controlling fan noise.

BIOS(2)

	DRAM Configuration			DRAM Configuratio	n
DRAM Timing Selectable - DRAM Clock - CAS Latency Time - Row Cycle Time - Row Refresh Cycle Time - Min. RAS# Active Time - RAS# to CAS# Delay - RAS# Precharge Time - RAS# to RAS# Delay - Write Recovery Time - Write Recovery Time - Write to Read Delay - Write Do Read Delay - Bank Interleaving - Burst Length	Manual DDR200 Auto Auto Auto Auto Auto Auto Auto Auto	- RAS# to RAS# De - Write Recovery - Write to Read D - Read to Write D - Bank Interleavi - Burst Length	- DRAM Auto DDR200 DDR266 DDR333	[] [1] [] []	
MTRR mapping mode 32 bit Dram Memory Hole	Continuous Auto	MTRR mapping mode 32 bit Dram Memor -	t∔:Mov	e ENTER:Accept ES	C:Abort

Memory configuration

Memory timing

The options for memory configuration are quite complete.

Advanced Chipset Features	SoftMenu Setup	
HT Frequency 3x DRAM Configuration Press Enter SSE/SSE2 Instructions Enabled System BIOS Cacheable Enabled	AMD Athion(tm) 64 Processor 3200+ Frequency : 1200MHz CPU Operating Speed Default	
HT Frequency	x - CPU FSB Clock(MHz) 200 x - Multiplier Factor 10x	
1x [] 2x [] 3x [] 4x [] 5x [] ↑↓:Move ENTER:Accept ESC:Abort	x - PCle Clock100MhzVoltages ControlDefaultx - CPU Core Voltage1.500 Ux - DDR RAM Voltage2.60 Ux - DDR Ref VoltageDefaultx - mForce4 4X Voltage1.50 Ux - HyperTransport VoltageDefault	

HyperTransport Frequency

Overclocking Options

While the nForce4-4x officially supports only 800MHz HT bus speed (4x), this motherboard is actually is the same as a standard nForce4 product that allows 1GHz HT speed, though Socket 754 CPUs still run at 800MHz.

	SoftMenu Setup		SoftMenu Setup	
AMD Athlon(tm) 64 Pr Frequency : 1200MHz		AMD Athlon(tm) 64 Pr Frequency : 1200MHz		
CPU Operating Speed User Define		CPU Operating Spee	d User Define	1
 CPU FSB Clock(M) Multiplier Fact PCIe Clock 	- CPU FSB Clock(MHz)	 CPU FSB Clock(Mg Multiplier Fact PCIe Clock 	- Multiplier Factor	
- PCIe Clock Voltages Control × - CFU Core Voltag × - DDR RAM Voltage × - DDR Ref Voltage × - nForce4 4X Volt × - HyperTransport		Voltages Control × - CPU Core Voltag × - DDR RAM Voltage × - DDR Ref Voltage × - nForce4 4X Volt × - HyperTransport	4x [∎] 4.5x [] 5x [] 5.5x [] 6x [] 6.5x [] 7x [] 7.5x []	ĺ
	14:Move ENTER:Accept ESC:Abort		11:Move ENTER:Accept ESC:	Abort
				1

CPU FSB Clock

CPU Multiplier

The CPU FSB clock is limited to 450MHz, which is plenty high.

BIOS(3)

	SoftMenu Setup	SoftMenu Setup			
ND Athlon(tm) 64 Pr requency : 1200MHz CPU Operating Spee		h	AND Athlon(tm) 64 Pr Frequency : 1200MHz CPU Operating Spee		
 CPU FSB Clock(M) Multiplier Fact PCIe Clock 	- PCIe Clock		 CPU FSB Clock(M) Multiplier Fact PCIe Clock 	- CPU Core Voltage	
	138Mhz []	٨		1.680 U []	
Voltages Control - CPU Core Voltag			Voltages Control - CPU Core Voltag		
- DDR RAM Voltage - DDR Ref Voltage				1.740 U [] 1.760 U []	
 nForce4 4X Volt HyperTransport 				1.780 V [] 1.800 V []	
adden manabute	145Mhz [*]		agger it ansport	1.950 V [#]	
	11:Move ENTER:Accept ESC:	Abort		11:Move ENTER:Accept ESC:Abort	
		1			

PCIe frequency

CPU Voltage

ABIT is the poster boy for motherboard overclocking – here too it provides a wealth of overclocking options with high enough adjustment margins. CPU voltage goes all the way up to 1.950V – that's definitely enough – and each increment is 0.02V with less accurate control than regular 0,0125V.

SoftHenu Setup
AND Athlon(tm) 64 Processor 3200+ Frequency : 1200MHz
CPU Operating Speed User Define
- CPU FSB Clock(M - Multiplier Fact - DDR Ref Voltage
- PCIe Clock
- 60 mV []
Voltages Control - 30 mV []
- CPU Core Voltag Default [m] - DDR RAM Voltage + 30 mV []
- DDR Ref Voltage
- nForce1 4X Volt
- HyperTransport
ti:Move_ENTER:Accept_ESC:Abor

Memory Voltage

An upper limit of 3.2V on memory is satisfying enough for overclocking enthusiasts.

	SoftMenu Setup	SoftMenu Setup	
AMD Athlon(tm) 64 Pr Frequency : 1200MHz CPU Operating Spee		AMD Athlon(tm) 64 Pr Frequency : 1200MHz CPU Operating Spee	
- CPU FSB Clock(H - Multiplier Fact - PCIe Clock Uoltages Control - CPU Core Voltag - DDR RAM Voltage - DDR Ref Voltage - Moreet 4X Volt - HyperTransport 1.50 U [] 1.55 U [] 1.60 U [] 1.65 U [] 1.60 U [] 1.60 U [] 1.60 U [] 1.70 U [] 1.80 U [] 1.80 U [] 1.90 U [] 2.00 U [] 1.90 U [] 1.90 U []		- CPU FSB Clock(M - Multiplier Fact - PCle Clock Voltages Control - CPU Core Voltag - DDR RAM Voltage - DDR Ref Voltage - nForce4 4X Volt - HyperTransport	- HyperTransport Voltage Default [] + 2 % [] + 4 % [] + 8 % [] + 12% [] + 16% [] t4:Move ENTER:Accept ESC:Abort

Chipset voltage

HT voltage

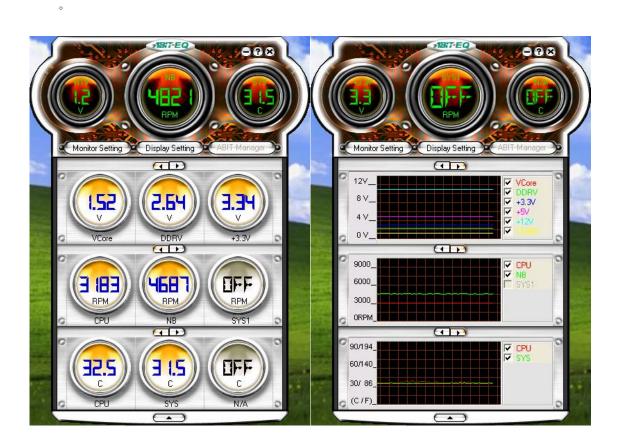
To ensure stability when overclocking, ABIT provides HT voltage adjustability.

Special Software: ABIT EQ (1)

The ABIT NV8 software complement contains the ABIT EQ and FlashMenu programs. FlashMenu is simply a BIOS update program; users can upgrade the BIOS while inside the Windows environment; retrieving the update file while connected to the internet. As there are many similar programs out there, we'll refrain from going into detail.



The ABIT EQ program is a system monitoring program capable of reporting temperature, fan speed and various voltage information.



ABIT's software development capabilities are something to behold – this user configuration panel is very usable and easy to learn. Real time information and historical charts are both available for use.

Special Software :ABIT EQ (2)

Display Setting				X
😔 Voltage 🚱	Fan 🛛 🚯 Temp	perature		
Display Item List +12V +3.3V +5V 5VSB CK804 DDRV HTV VCore	Add >> Select All Remove Apply	Main Screen +12V +3.3V +5V 5VSB CK804 DDRV HTV VCore	Add >>	SubScreen +3.3V DDRV VCore
└─ Warning alert	by E-Mail 🏼 🗍			
Error log reco	rding	View Error Log	9	
🔲 Run ABIT EQ	when system st	art up.		<i>-181</i> 7-
	\subset	DK Cancel	•	

The user panel is completely customizable and can be made to show only information the user wants. The system can even be setup to provide email alerts.

onitor Se					_		Load
ltem ∙Voltage Se	Value :tting ——	Low-L	.imit	Hi-Limit	Веер	Shut Down	Default
VCore	1.52	0.00		1.72	\checkmark		Default
DDRV	2.66	2.34		2.86	\checkmark		Default
+3.3V	3.34	3.10		3.50	\checkmark		Default
+5V	5.21	4.50		5.50	◄		Default
+12V	11.19	10.80		13.20	◄		Default
CK804	1.54	1.39	📫 📖	1.70	\checkmark		Default
HTV	1.23	1.08	💻 	1.32	\checkmark		Default
5VSB	4.94	4.50		5.50			Default
Fan Setting	y ———						
CPU	3183	1016			◄		Default
NB	4821	1016			◄		Default
SYS1	OFF		, <u> </u>				Default
Smart I	Fan Enable	•					
Temperatu	re Setting						
CPU	32.5			85.	0 🔽		Default
SYS	32.0		·	85.	0 🔽		Default
Temp	Value		1	ł	li 🗖		Default
Centig	rade	0	Fahrenheit				13:7-
e	Default Se	etting		Apply		Ca	ncel

Beeps, alerts, and shut down safety options are completely user-defined.

Overclocking Test

ABIT motherboard offerings have made a name for being impressively overclockable. That is reason enough to include an overclocking test in the report.

Taking our efforts one step further, we utilized the ClockGen program for Windows overclocking.

OlockGen for nForce4	
K8 FID /VID	
Multiplier Control Max x 10.0 Current x 6.0 Max x 10.0 New Value x 6.0 ▼ Startup x 10.0	
Voltage Control Current 1.500 ∨ Max 1.550 ∨ New Value 1.500 ∨ Startup 1.500 ∨	Apply FID Apply VID
Clocks	
	D-E PCI 0.00 33.34
Selected 1934.47 322.41 214.94 100	0.00 33.34
Selection HTT < PCI-E <	
Get Values Set Values	
About	

ClockGen is capable of making adjustments to the CPU multiplier, voltage and HT frequency. The limitation is the 1.550V upper limit for the CPU voltage. This voltage can still be changed in the BIOS, though. If the HT bus is going to be seriously overclocked, make sure to go into the BIOS and set the HT multiplier to 3X or below.

🗢 CPU-Z											
CPU	Cache	Mainbo	ard	Memor	y si	PD	Ab	out			
Processor											
	Name	AMD Athlon 64 3200+							Α	MD	
Code Name		ClawHammer			Brand ID 4			4	1		
Package		Socket 754								41	
Technology		0.13 µ	0.13 µ Vottage 1.616 v						At	hlon	
Specifi	cation	AMD Athlon(tm) 64 Processor							3200+		
F	Family		Mode		:I	4 S		Stepp	oing	8	
Ext. F	Ext. Family		Ext. Mode		1	4 Rev		Revi	ision SH7-CO		
Instru	Instructions MMX (+), 3DNow! (+), SSE, SSE2, x86-64										
Clocks	Clocks										
Core	Core Speed		1934.5 MHz			L1 Data			64 KBytes		
Mu	Multiplier		× 6.0			L1 Code			64 KBytes		
	HTT 322		.4 Mł	Hz		Level 2		· ·	1024 KBytes		
Bus	Bus Speed					Level 3					
Processor Selection CPU #1											
СРИ-Z ОК											

The ClockGen program allows the HT bus to be overclocked to a very impressive and still stable 322.4MHz, which is a frequency impossible for K8T800 Socket 754 motherboards. This proves conclusively that this ABIT motherboard has got outstanding overclocking performance.

🗢 CPU-Z 📃 🗖 🔀											
CPU	Cache	Mainbo	ard	Memory	y SF	D	Ab	out			
Processor											
	Name	AMD Athlon 64 3200+							Α	MD	
Code Name		ClawHammer				Brand ID 4			1		
Package		Socket 754								41	
Technology		0.13 µ	13 μ Voltage 1.664 v						At	hlon	
Specifi	cation	AMD Athlon(tm) 64 Processor 3200+									
F	Family			Mode		4	Step		ping	8	
Ext. F	Ext. Family		Ext. Mode		:I	4	Revis		sion	SH7-C0	
Instru	Instructions MMX (+), 3DNow! (+), SSE, SSE2, x86-64										
Clocks	Clocks										
Core	Core Speed		2278.0 MHz			L1 Data			64 KBytes		
Mu	Multiplier		× 10.0			L1 Code			64 KBytes		
	HTT 227		.8 MF	Ηz		Level 2			1024 KBytes		
Bus	Bus Speed				Level 3						
Processor Selection CPU #1 APIC ID 0											
Version 1.30											
СРИ-Z ОК											

Our CPU is fabbed on the 0.13 micron process and is a bit old in the tooth, so it isn't that impressive in the overclocking potential. The upper overclocking limit for this CPU is approved to be 2290MHz. With the NV8 it is capable of 2278MHz, which almost reaches its limit.

Summary

At a price below \$80 this nForce4 motherboard is a seriously good deal. And although the NV8 utilizes an nForce4-4x chipset according to the spec sheet, as we have already proven above, there is little that shows it is any different to a standard nForce4 motherboard.

The ABIT NV8 is outstanding both in terms of performance and stability, and features full support for PCI Express x16 graphics cards, Gigabit Ethernet, and the NVIDIA firewall; meaning that it's got most users covered.



Overclocking is definitely one of this motherboard's strong suits. For now, it should be the overclocking leader among Socket 754 products.

The release of the 64-bit Semprons is sure to motivate purchasing for high-price-performance Socket 754 motherboards – especially those who are known masters of overclocking. Sempron processors have already been proven to be great overclocking candidates, and are in no way inferior to the Athlon 64 in that respect. This is definitely a major reason why users will opt for the Socket 754 platform, and the ABIT NV8 is poised perfectly for the task.