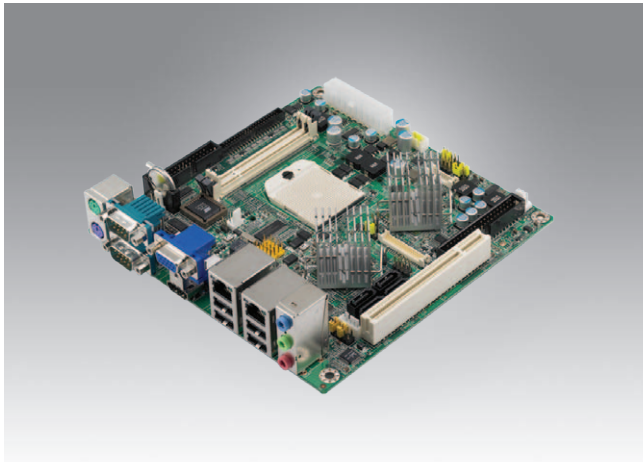# AIMB-221

AMD Turion™ and Sempron™ Mini-ITX with VGA/LVDS/HDMI, 6 COM, and Dual LAN Port

Features

- Supports AMD Turion™ 64 X2 and Sempron™ mobile processor-AMD M690E and SB600
- Two 200-pin SODIMMs, up to 4 GB DDR2 533/667/800 MHz SDRAM
- Supports dual display for VGA, HDMI, LVDS
- Supports 6 serial ports, 4 SATA 2.0 ports and TPM (optional)
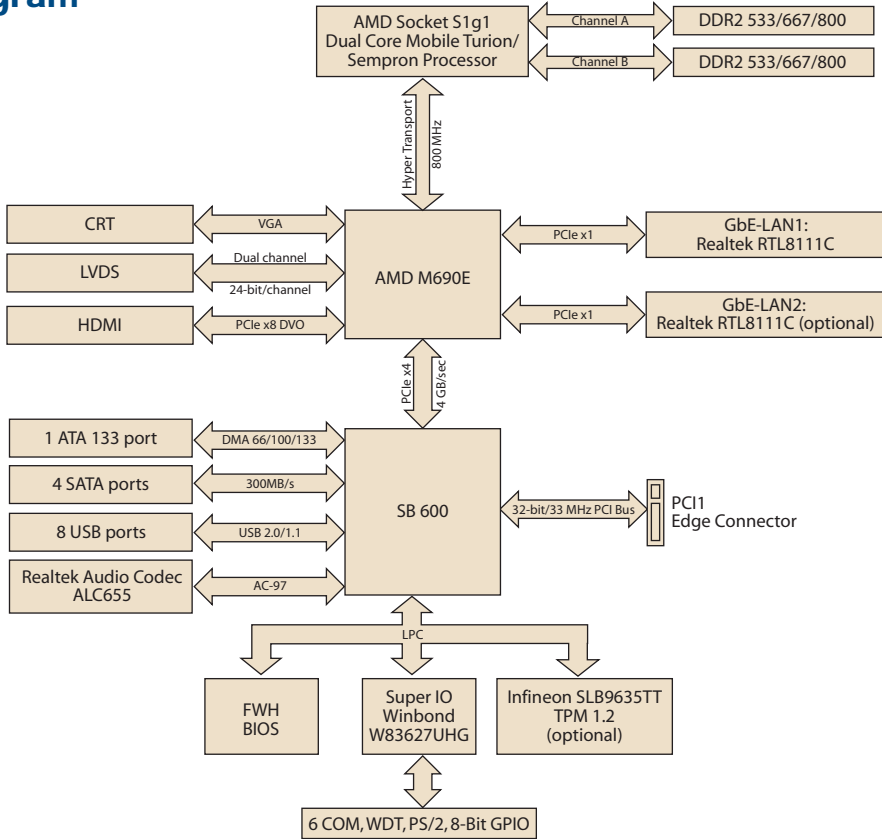- Supports embedded doftware APIs and utilities

Software APIs: H/W Monitor GPIO Watchdog

Utilities: BIOS flash Monitoring

RoHS COMPLIANT 2002/95/EC CE FCC

Windows Embeddec

Specifications

Processor System	CPU (65 nm S1g1)	AMD Turion 64 X2 TL-62	AMD Turion 64 X2 TL-56	AMD Sempron 3700+	AMD Sempron 2100+
	Max. Speed	2.1 GHz (dual core)	1.8 GHz (dual core)	2.0 GHz	1.0 GHz
	Hyper Transport Speed	800 MHz	800 MHZ	800 MHz	800 MHz
	L2 Cache	1 MB	1 MB	512 KB	256 KB
	Chipset	AMD M690E and SB 600			
	BIOS	Award 4 Mbit via LPC, FWH			
Expansion Slot	PCI	32-bit/33 MHz, 1 slot			
	Mini-PCI	32-bit/33 MHz, 1 slot			
	PCIe	-			
Memory	Technology	Dual channel DDR2 533/667/800 MHz SDRAM			
	Max. Capacity	4 GB			
	Socket	2 x 200-pin SODIMMs			
Graphics	Controller	AMD M690E Integrated ATI Radeon X1250-based graphic engine			
	VRAM	Shared system memory up to 512 MB video memory			
	LVDS	Single channel 18/24-bit Dual channel 36/48-bit LVDS			
	HDMI	Supports HDMI 1.2, 1650 Mbps/channel with 165 MHz			
	DVI	-			
	Dual Display	CRT + LVDS, CRT + HDMI, HDMI + LVDS			
Ethernet	Interface	10/100/1000 Mbps			
	Controller	GbE LAN1: Realtek RTL8111C; GbE LAN2: Realtek RTL8111C			
	Connector	RJ-45 x 2			
SATA	Max Data Transfer Rate	300 MB/s			
	Channel	4 (supports software RAID 0 and 1)			
EIDE	Mode	EIDE (Ultra DMA 133)			
	Channel	1			
SSD	CompactFlash	Supports CompactFlash Type I/II			
Rear I/O	VGA	1			
	HDMI	1			
	Ethernet	2			
	USB	4 (USB 2.0 compliant)			
	Audio	3 (Mic-in, Line-out, Line-in)			
	Serial	2 (COM 1: RS-232; COM 2: RS-232/422/485)			
	PS/2	2 (1 x keyboard and 1 x mouse)			
Internal Connector	LVDS	1			
	DVI	-			
	USB	4 (USB 2.0 compliant)			
	Serial	4 (RS-232)			
	IDE	1			
	SATA	4			
	CompactFlash	1			
	Parallel	1			
	IrDA	-			
	FDD	-			
	DIO	8-bit General Purpose I/O for DI and DO			
Watchdog Timer	Output	System reset			
	Interval	Programmable 1 ~ 255 sec/min			
Power Requirements	Power On	Turion 64 X2 TL-62 2.1GHz HT 800 MHz, 4GB DDR2 SDRAM			
		+5 V	+3.3 V	+12 V	
		3.45 A	0.72 A	2.45 A	
Environment		Operating		Non-Operating	
	Temperature	0 ~ 60° C (32 ~ 140° F)		-20 ~ 70° C (-4 ~ 158° F)	
Physical Characteristics	Dimensions	170 mm x 170 mm (6.69" x 6.69")			

Board Diagram

```
AMD Socket S1g1      Channel A      DDR2 533/667/800
Dual Core Mobile Turion/
Sempron Processor    Channel B      DDR2 533/667/800
```

Hyper Transport 800 MHz

```
CRT          VGA                              PCIe x1      GbE-LAN1:
                                                           Realtek RTL8111C
LVDS         Dual channel      AMD M690E
             24-bit/channel
HDMI         PCIe x8 DVO                      PCIe x1      GbE-LAN2:
                                                           Realtek RTL8111C (optional)
```

PCIe x4 / 4 GB/sec

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1 ATA 133 port      DMA 66/100/133
4 SATA ports        300MB/s              SB 600          32-bit/33 MHz PCI Bus    PCI1
8 USB ports         USB 2.0/1.1                                                   Edge Connector
Realtek Audio Codec AC-97
ALC655
```

LPC

```
FWH          Super IO            Infineon SLB9635TT
BIOS         Winbond             TPM 1.2
             W83627UHG           (optional)
```

6 COM, WDT, PS/2, 8-Bit GPIO

Ordering Information

Part Number	GbE	Mini PCI	CF	COM
AIMB-221G2-00A1E	2	1	1	6

Packing List

Part number	Description	Quantity
1701400452	IDE HDD cable (40-pin)	1
1700003194	SATA HDD cable	2
1700017461	SATA power cable	2
1750001620	CPU cooler	1
1960019192T100	I/O port bracket	1
2006022110	Startup manual	1
2066022100	Driver CD	1

Optional Accessories

Part Number	Description
1700003195	USB cable with two ports, 17.5 cm
1700002204	USB cable with two ports, 27 cm
1700008461	USB cable with four ports, 30.5 cm
1700008809	Printer port cable, 25 cm, w/ bracket

Embedded OS/API

OS/API	Part No.	Description
Win XPE	2070004329	XPE SP2 FP2007AIMB-221 V3.5 ENG
	2070005291	XPE FP2007 AIMB-221 V3.5.0 JPN_ENG
Software API	205E000021	SUSI 3.0 SW API for AIMB-221 XP

I/O View

AIMB-221G2-00A1E

Value-Added Software Services

Software API: An interface that defines the ways by which an application program may request services from libraries and/or operating systems. Provides not only the underlying drivers required but also a rich set of user-friendly, intelligent and integrated interfaces, which speeds development, enhances security and offers add-on value for Advantech platforms. It plays the role of catalyst between developer and solution, and makes Advantech embedded platforms easier and simpler to adopt and operate with customer applications.

Software APIs

Control

GPIO

General Purpose Input/Output is a flexible parallel interface that allows a variety of custom connections. It allows users to monitor the level of signal input or set the output status to switch on/off a device. Our API also provides Programmable GPIO, which allows developers to dynamically set the GPIO input or output status.

SMBus

SMBus is the System Management Bus defined by Intel® Corporation in 1995. It is used in personal computers and servers for low-speed system management communications. The SMBus API allows a developer to interface a embedded system environment and transfer serial messages using the SMBus protocols, allowing multiple simultaneous device control.

I²C

I²C is a bi-directional two wire bus that was developed by Philips for use in their televisions in the 1980s.
The I²C API allows a developer to interface with an embedded system environment and transfer serial messages using the I²C protocols, allowing multiple simultaneous device control.

Monitor

Watchdog

A watchdog timer (WDT) is a device that performs a specific operation after a certain period of time if something goes wrong and the system does not recover on its own.
A watchdog timer can be programmed to perform a warm boot (restarting the system) after a certain number of seconds.

Hardware Monitor

The Hardware Monitor (HWM) API is a system health supervision API that inspects certain condition indexes, such as fan speed, temperature and voltage.

Hardware Control

The Hardware Control API allows developers to set the PWM (Pulse Width Modulation) value to adjust fan speed or other devices; it can also be used to adjust the LCD brightness.

Display

Brightness Control

The Brightness Control API allows a developer to interface with an embedded device to easily control brightness.

Backlight

The Backlight API allows a developer to control the backlight (screen) on/off in an embedded device.

Power Saving

CPU Speed

Make use of Intel SpeedStep technology to reduce power power consumption. The system will automatically adjust the CPU Speed depending on system loading.

System Throttling

Refers to a series of methods for reducing power consumption in computers by lowering the clock frequency. These APIs allow the user to lower the clock from 87.5% to 12.5%.

Software Utilities

BIOS Flash

The BIOS Flash utility allows customers to update the flash ROM BIOS version, or use it to back up current BIOS by copying it from the flash chip to a file on customers' disk. The BIOS Flash utility also provides a command line version and API for fast implementation into customized applications.

Embedded Security ID

The embedded application is the most important property of a system integrator. It contains valuable intellectual property, design knowledge and innovation, but it is easily copied! The Embedded Security ID utility provides reliable security functions for customers to secure their application data within embedded BIOS.

Monitoring

The Monitoring utility allows the customer to monitor system health, including voltage, CPU and system temperature and fan speed. These items are important to a device; if critical errors happen and are not solved immediately, permanent damage may be caused.

eSOS

The eSOS is a small OS stored in BIOS ROM. It will boot up in case of a main OS crash. It will diagnose the hardware status, and then send an e-mail to a designated administrator. The eSOS also provides remote connection: Telnet server and FTP server, allowing the administrator to rescue the system.

Flash Lock

Flash Lock is a mechanism that binds the board and CF card (SQFlash) together. The user can "Lock" SQFlash via the Flash Lock function and "Unlock" it via BIOS while booting. A locked SQFlash cannot be read by any card reader or boot from other platforms without a BIOS with the "Unlock" feature.