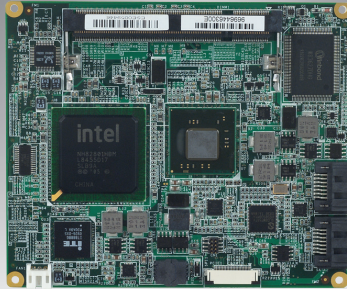


# SOM-4463 A2

Intel® Atom™ Processor  
N450/D510 ETX CPU Module



## Features

- Embedded Intel® Atom™ Processor N450 1.66 GHz single core/ D510 1.66 GHz dual-core + ICH8M
- Intel Gen 3.5 DX9, MPEG2 Decode in HW, multiple display: VGA, 18-bit LVDS
- Supports DDR2 SODIMM up to 2 GB
- Supports 4 PCI, 2 SATAII, 4 USB 2.0, ISA
- Supports embedded software APIs and Utilities

**Software APIs:**

- Watchdog
- IPC
- SMBus
- H/W Monitor
- Brightness
- GPIO
- Backlight On/Off

**Utilities:**

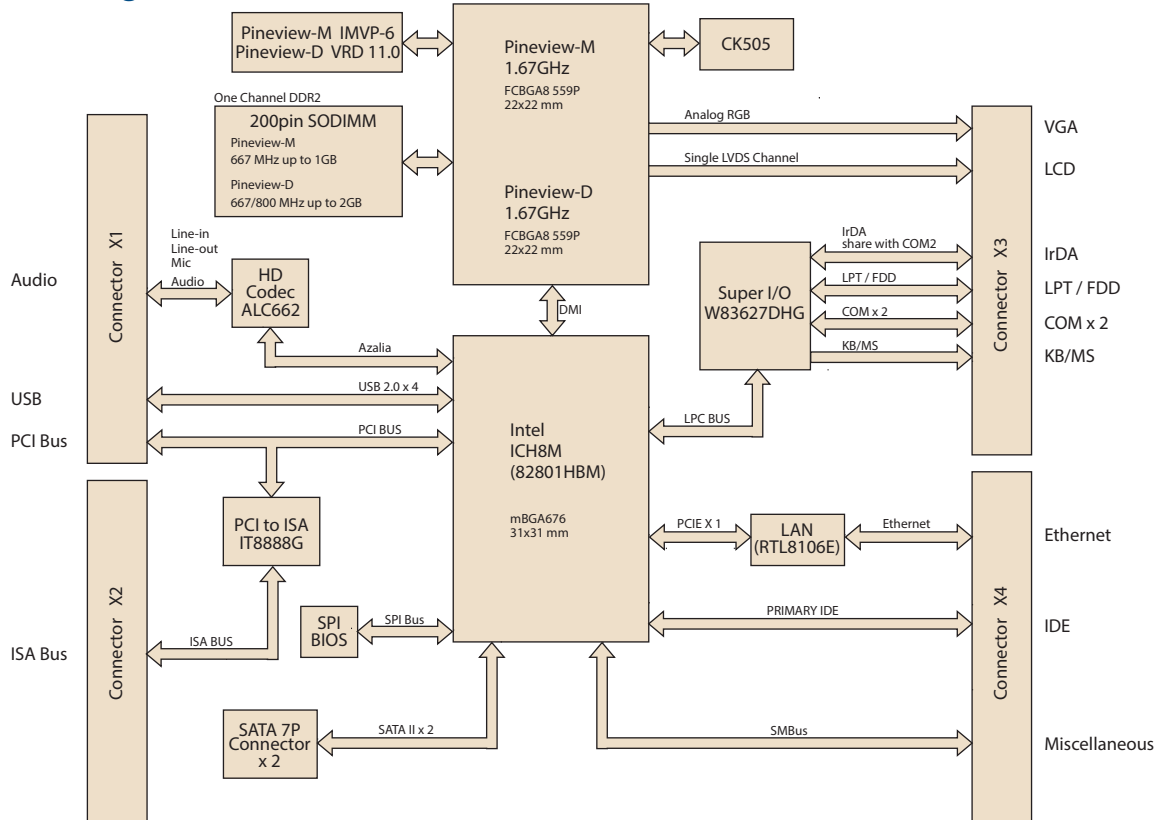
- BIOS flash
- Monitoring
- Flash Lock
- Embedded Security ID



## Specifications

Form Factor		ETX 3.0
Processor System	CPU	Intel Atom N450 1.66 GHz (single core), 512 KB L2 Cache Intel Atom D510 1.66 GHz (dual core), 1 MB L2 Cache
	System Chipset	ICH8M
	BIOS	AMI 16 Mbit Flash BIOS
Memory	Technology	DDR2 667 MHz
	Max. Capacity	Up to 2 GB
	Socket	1 x 200-pin SODIMM sockets
Display	Chipset	Intel Atom N450 or Intel Atom D510
	Graphic Engine	Intel Gen 3.5 DX9, MPEG2 Decode in HW
	LVDS	18-bit single channel LVDS
	VGA	Intel Atom N450 Single Core up to 1400 x 1050 (SXGA) Intel Atom D510 Dual Core up to 2048 x 1536
	DVI	-
	TV Out	-
	SDVO	-
	Dual Display	CRT + LVDS
Ethernet	Chipset	Realtek 8106E 10/100 Mbps Ethernet
	Speed	10/100 Mbps
WatchDog Timer		256 level timer interval, from 0 to 255 sec or min setup by software, jumperless selection, generates system reset
Expansion		ISA, 4 PCI masters
I/O	PATA	1 x EIDE (UDMA 100)
	SATA	2 x SATAII (300 MB/s)
	USB	4 x USB 2.0
	Audio	ALC662 Audio
	GPIO	1-bit GPIO, 2-bit GPE
	COM	2 x COM Ports
	FDD/LPT	1 x FDD or LPT
Power	Power Type	ATX, AT
	Power Supply Voltage	+5 V (+5VSB is required for ATX power scheme)
	Power Consumption (Idle)	To be updated
	Power Consumption (Max, test with BurnIn Test)	To be updated
Environment	Operating Temperature	0 ~ 60° C (32 ~ 140° F)
	Operating Humidity	0% ~ 90% relative humidity, non-condensing
Mechanical	Dimensions	95 x 114 mm (3.74" x 4.5")

## Board Diagram



## Ordering Information

Part No.	CPU	L2 Cache	Chipset	LVDS	VGA	10/100 LAN	HD Audio	PCI	USB 2.0	SATA	SMBus	ATX Power	AT Power	Thermal Solution	Operating Temp.
SOM-4463N-S6A2E	Atom N450	512 KB	ICH8M	18-bit	Yes	1	Yes	4	4	2 x SATAII	1	Yes	Yes	Passive	0 ~ 60° C
SOM-4463D-S6A2E	Atom D510	1 MB	ICH8M	18-bit	Yes	1	Yes	4	4	2 x SATAII	1	Yes	Yes	Active	0 ~ 60° C

## Development Board

Part No.	Description
SOM-DB4700-00A1E	Development Board for ETX Rev.A1

## Optional Accessories

Part No.	Description
1960012091T00S	Semi-Heatsink 114 x 96 x 15 mm
1750001980	Semi-Cooler 114 x 96 x 15 mm

## Packing List

Part No.	Description	Quantity
-	SOM-4463 CPU Module	1
-	Utility CD	1
1960047537T001	Heatspreader	1
1960049773T011	Heatspreader for wide temperature product	1 (For Extend-temperature SKU)

## Embedded OS

OS	Part No.	Description

# 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.

### 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.

### 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.

### Power Saving



**CPU Speed**

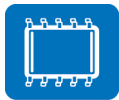
Make use of Intel SpeedStep technology to reduce power consumption. The system will automatically adjust the CPU Speed depending on system loading.



**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.