AMI210

User Manual

2016 May Ver. A1

Table of Contents

Safety Information

Your AMI210 is designed and tested to meet the latest standards of safety for information technology equipment. However, to ensure your safety, it is important that you read the following safety instructions

Setting up your system

- Read and follow all instructions in the documentation before you operate your system.
- Do not use this product near water.
- Set up the system on a stable surface. Do not secure the system on any unstable plane.
- Do not place this product on an unstable cart, stand, or table. The product may fall, causing serious damage to the product.
- Slots and openings on the chassis are for ventilation. Do not block or cover these openings. Make sure you leave plenty of space around the system for ventilation. ***Never insert objects of any kind into the ventilation openings***.
- This system should be operated from the type of power indicated on the marking label. If you are not sure of the type of power available, consult your dealer or local power company.
- Use this product in environments with ambient temperatures between 0˚C and 40˚C.
- If you use an extension cord, make sure that the total ampere rating of the devices plugged into the extension cord does not exceed its ampere rating.
- DO NOT LEAVE THIS EQUIPMENT IN AN ENVIRONMENT WHERE THESTORAGE TEMPERATURE MAY GO BELOW -20° C (-4° F) OR ABOVE 80° C (176° F). THIS COULD DAMAGE THE EQUIPMENT. THE EQUIPMENT SHOULD BE IN A CONTROLLED ENVIRONMENT.

Care during use

- Do not walk on the power cord or allow anything to rest on it.
- Do not spill water or any other liquids on your system.
- When the system is turned off, a small amount of electrical current still flows. Always unplug all power, and network cables from the power outlets before cleaning the system.
- If you encounter the following technical problems with the product, unplug the power cord and contact a qualified service technician or your retailer.
  - The power cord or plug is damaged.
  - Liquid has been spilled into the system.
  - The system does not function properly even if you follow the operating instructions.
  - The system was dropped or the cabinet is damaged.

Lithium-Ion Battery Warning

CAUTION: Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

NO DISASSEMBLY

The warranty does not apply to the products that have been disassembled by users

WARNING
HAZARDOUS MOVING PARTS
KEEP FINGERS AND OTHER BODY PARTS AWAY

Acknowledgments

- AMI is a registered trademark of AMI Software International, Inc.
- Microsoft Windows is a registered trademark of Microsoft Corporation.
- FINTEK is a registered trademark of FINTEK Electronics Corporation.
- REALTEK is a registered trademark of REALTEK Electronics Corporation.
- All other product names or trademarks are properties of their respective owners.

CHAPTER 1 INTRODUCTION

1.1 General Description

The fanless AMI210 system comes with the ibase customized board MB210 and integrates the 4th Intel® Core™ i7/i5/i3 pentium™ and celeron™ processor that featuring 14nm microarchitecture and 3-D Tri-Gate transistors. With unparalleled reliability, the 2.7GHz processor allows the AMI210 to operate in wide temperatures at -10°C to +50°C in harsh industrial environments for 24/7 operation. The AMI210 is ideal for IOT (Internet of Things), factory automation, In-vehicle and other rugged applications that could utilize its 12V to 24V DC wide-range power input.

AMI210 supports up to 16GB DDR3L-1600 SO-DIMM memory and provides SATAIII/ CFast interfaces for storage expansions. For network connectivity, AMI210 supports 2x Intel® I218LM/V and I211AT LAN ports onboard for dual network teaming functions. For power input range, AMI210 supports 12~24V DC Input and this is significant design improvement for allowing more voltage fluctuation of DC power source.

Measuring 210mm(W) by 265mm(D) by 71.6mm(H) for non-expansion slot version and 210mm(W) by 265mm(D) by 134mm(H) for expansion slot version, the AMI210 unit comes with a wall mount kit. We also provide the DC power adaptor for optional item if necessary . The model is currently available with either a 2.5-inch 64GB industrial grade SSD or CFAST slot installation. Expansion is provided by two Mini PCI-E slots. All units feature IBASE's iSMART green technology for power on/off scheduling and power resume functions.

1.2 System Specifications

1.2.1 Hardware Specifications

Engineer Specifications

Motherboard	iBASE Customized motherboard of MB210
CPU type	Intel® 4th Generation Desktop Core™ i5/i3/Celeron DT Processor - Intel® Core™ i7-4770TE (2.3Ghz) TDP=45W - Intel® Core™ i5-4570TE (2.7Ghz) TDP=35W - Intel® Core™ i5-4590T (2.0Ghz) TDP=35W - Intel® Core™ i3-4350T (3.1Ghz) TDP=35W - Intel® Core™ i3-4330TE (2.4Ghz) TDP=35W

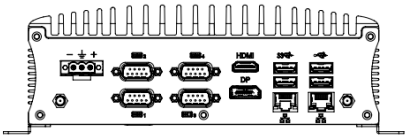
	- Intel® Celeron® G1820TE (2.2Ghz) TDP=35W **Yellow = Haswell Refresh**
Chipset	Intel® Q87/H81Platform Controller Hub - 23 x 22 mm package size, 0.65mm ball pitch
Graphics	Core I processor Integrated Intel® HD Graphics 4000 Controller
Memory	2 x DDR3-1600 SO-DIMM 2 GB, Max. 16GB (Non-ECC) - TRANSCEND TS7W9SDSQ-I with Samsung chip RoHS - P/N: **C0373900200081520P**
I/O Interface	
Rear Panel I/O	1 x RS422/485 port with isolation protection for COM#1 1 x RS232 port for COM#2 2 x RS232 port for COM#3/COM#4 1 x DisplayPort + HDMI connector 1 x RJ45 Gigabit Ethernet port + 2 x USB3.0 ports 1 x RJ45 Gigabit Ethernet port + 2 x USB2.0 ports 1 x 3 pins DC-in terminal block type for 12~24V *** **Resistance current to 15A per pin** *
Front Panel I/O	1 x DVI-D + 1 x VGA for video output 1 x Audio jack for MIC-in / Line-out 2 x USB2.0 ports ** co-lay with USB3.0 connector ** 2 x Antenna hole [Reserved] 1 x red HDD LED 1 x power button with green PWR LED 1 x CFAST socket [push-push type] **P/N: C1236220024110200P** 1 x 2 pins terminal block [co-lay with power on] For external power button
Storage Interface	
SATA	1 x SATAIII port for 2.5” SATA HDD or SSD
mSATA	1 x internal mSATA socket
CFAST	1 x CFAST socket
Expansion slots & I/O for optional combination	
IP212	- 1 x PCI-E(x16) slot
IP211 [default] ***thruPCI-E(x16) + PCI-E(x4)***	- 1 x PCI-E(x8) slot - 1 x PCI-E(x1) slot - 1 x SATAII connector - 4-pins power connector x 1 (JST type, For SATA device) - 2 x DF-11 10-pin box-header for 2 ports COM [for TX/RX signal only]

	- 1 x DF-11 8-pin box-header for 2 ports USB - 1 x FAN for 3 pins - 1 x SMbus for 2 pins [TBD]
Power Supply	
DC-input	1x 3-pins pluggable terminal block for 12~24V DC input (for bare wire)
Mechanical	
Dimension	210mm(W) x 265mm(D) x 71.6mm(H) (AMI210) 210mm(W) x 265mm(D) x 134mm(H) (AMI210-PE)
Weight	3.6kg (AMI210), 4.3kg (AMI210-PE)
Construction	Aluminum
Chassis color	Silver + Gray
Mounting type	Wall mount kit
Environmental	
Operating Temperature	-10°C~50°C (-4°F~122°F) **for 35W CPU ** -10°C~45°C (-4°F~113°F) **for 45W CPU **
Storage Temperature	-20°C~80°C (-4°F~176°F)
Humidity	5%~90%@45°C (non-condensing)
Vibration	Operating : 0.25Grms / 5~500Hz Non-operating : 1Grms / 5~500Hz
Shock	Operating : 20G / 11ms Non-operating : 40G / 11ms
Certification	CE ****follow EN55032**** FCC ClassB / LVD
Regulation	RoHS 2.0

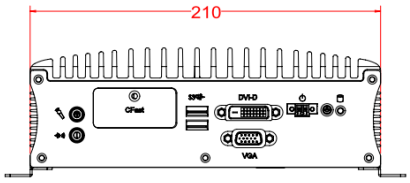
·This specification is subject to change without prior notice.

1.2.2 Dimensions

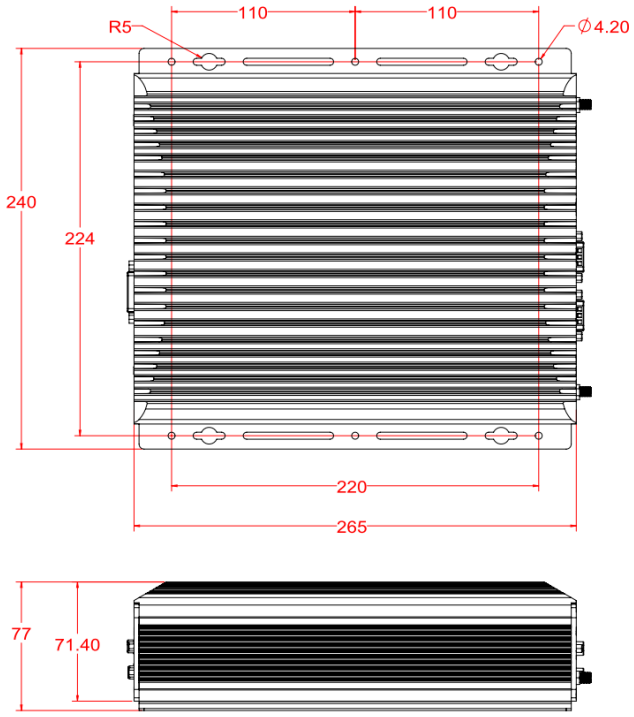
AMI210 Drawing



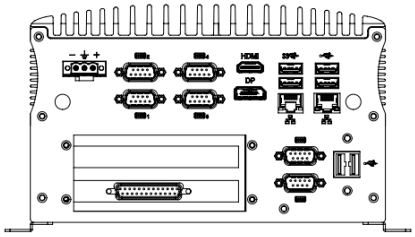
Rear View



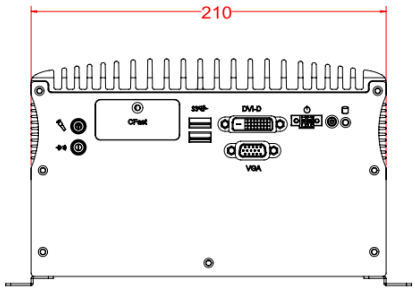
Front View



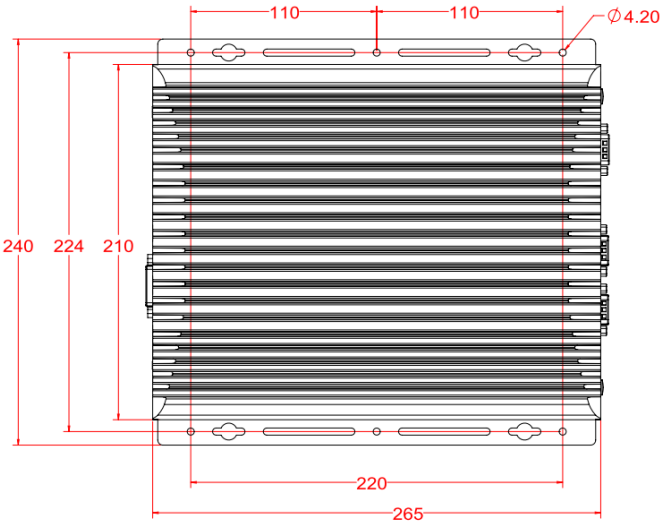
AMI210-PE Drawing

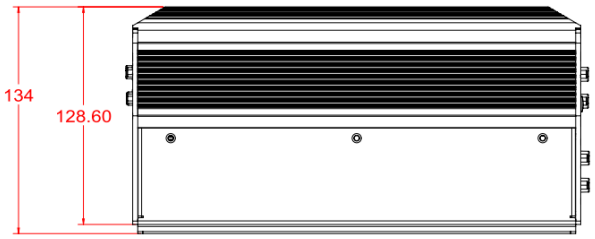


Rear View



Front View





1.2.3 I/O View

Line-out Mic-in	CFAST	USB3.0/Q87 USB2.0/H81	DVI-D VGA	Power on	Power switch HDD LED

DC-in put 12~24V	1 x RS422/485 with isolation	3 x RS232	HDMI DP Port	2 x RJ45	2 x USB3.0 2 x USB2.0

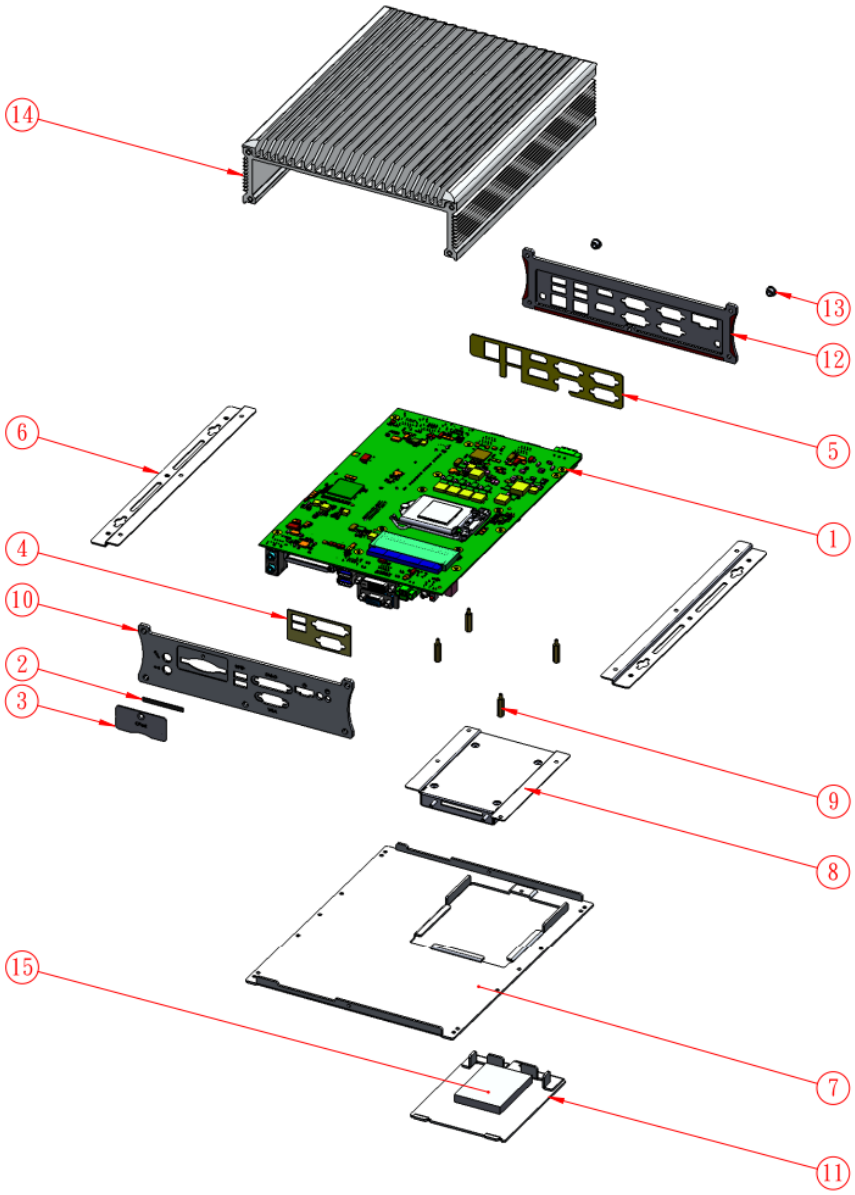
Line-out Mic-in	CFAST	USB3.0/Q87 USB2.0/H81	DVI-D VGA	Power on	Power switch HDD LED

DC-in put 12~24V	1 x RS422/485 with isolation	3 x RS232	HDMI DP Port	2 x RJ45	2 x USB3.0 2 x USB2.0

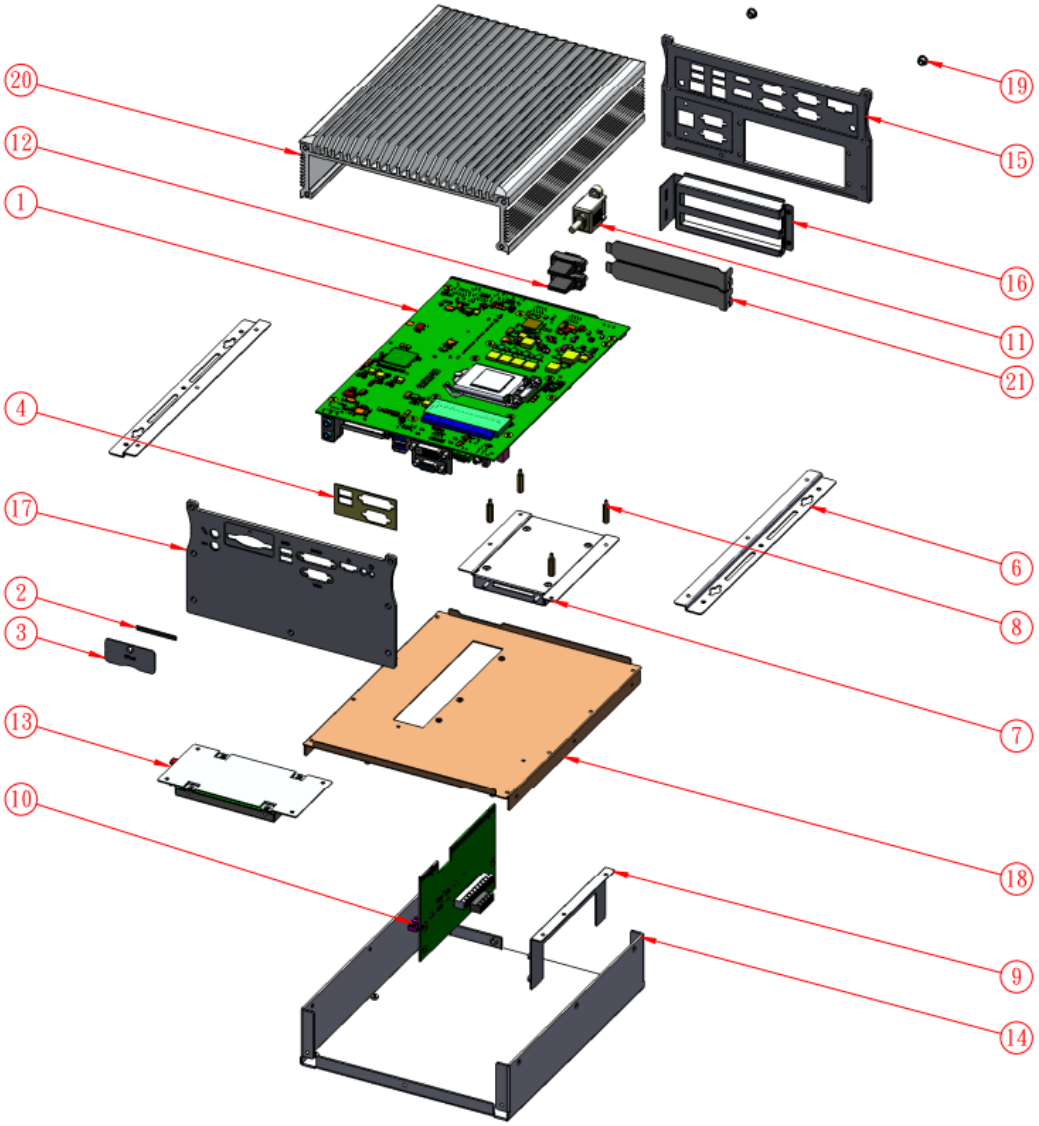
2x expansion slots	2 x RS232 (TX RX only)	2 x USB2.0

1.3 Exploded View of the AMI210/AMI210-PE Assembly

AMI210



AMI210-PE



1.3.1 Parts Description

AMI210

1	MB210_B1 board asm	1
2	AMI210-Cfast rubber	1
3	AMI210_Cfast-brk	1
4	AMI210_IO gasket-1	1
5	AMI210-IO gasket-2	1
6	AMI210_bracket	2
7	AMI210_base bracket asm	1
8	AMI210-hdd brk_asm	1
9	SC-47 H0323173342200000P	4
10	AMI210_front plate_1	1
11	AMI210_base hdd-1	1
12	AMI210_rear_plate_1	1
13	MHD-10I	2
14	ami210-hs-1_b2_asm-2016-01-11	1
15	AMI210-hdd rubber	1
16	EC350VM-02P	1
17	5esdvm-03p	1

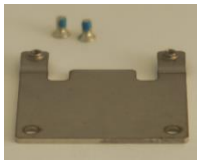
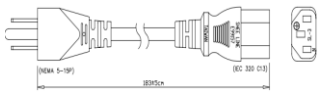
AMI210-PE

1	MB210_B1 board asm	1
2	AMI210-Cfast rubber	1
3	AMI210_Cfast-brk	1
4	AMI210_IO gasket-1	1
5	AMI210-IO gasket-2	1
6	AMI210_bracket	2
7	AMI210-hdd brk_asm	1
8	SC-47 H0323173342200000P	4
9	AMI210-PE_IP211 brk	1
10	IP211_pci_e_riser card_asm	1
11	CC-08	1
12	CC-01	2
13	AMI210-1 hdd module	1
14	AMI210-PE_base	1
15	AMI210_rear_plate_2	1
16	AMI210-PE_pci brk_2	1
17	AMI210_front plate_2	1
18	AMI210-PE_base bracket	1
19	MHD-10I	2
20	ami210-hs-1_b2_asm-2016-01-11	1
21	P26_H06P0260000000000	2

1.4 Packing List

Item No.	Description	Qty
1	Driver DVD	1
3	Wall mount kit	2

1.4.1 Optional Items

WiFi Solution	Description	
WiFi module	WIRELESS;PCI-E MINI CARD 802.11B/G/N [AW-NE238H] (A008WLAWNE238H000P)	
External Antenna	WiFi Antenna (A055RFA02C2M20800P)	
Internal cable-1/2	From Wifi module to Rear/Front panel (A055RFA0000021000P/A055RFA0000032000P)	 
Bracket	MPCIE-EXT V-B1 Bracket, RoHS; Extend Half to Full size. (SC2MPCIEEXT0B1100P)	
3G Solution	**Description**	
ZU 202	Wireless; 3.75G UMTS/HSPA [ZU202] RoHS (A008WIRELESS00520P)	
ZU 200	Wireless; 3.75G UMTS/HSPA & GPS Module [ZU200] RoHS (A008WIRELESS00510P)	
Cable	Cable; Antenna-2 30CM P 2pcs (C501ANT0200300000P)	
Antenna	Antenna; 3G, P, 2pcs (A055ANT0921Q2P000P)	
Power kit	**Description**	
Power Adaptor	P/S; ADAPTER 120W 12V 2 PIN bare wire type, FSP120-AHAN2] (A005PS120WF030100P) (For AMI210) P/S; ADAPTER 150W 12V 2 PIN bare wire type, FSP150-AHAN2] (A005PS150W0314000P) (For AMI210-PE)	
Power Cord	PW CORD; Chinese/American/Japan 3PIN 10A (A030PCAM040100000P)	

CHAPTER 2 MOTHERBOARD INTRODUCTION

2.1 Introduction

The MB210 motherboard is based on the latest Intel® Q87/H81 chipset. The platform supports onboard 4th generation Intel® Core processor family features an integrated dual-channel DDR3 memory controller as well as a graphics core.

The latest Intel® processors provide advanced performance in both computing and graphics quality. This meets the requirement of customers in the gaming, POS, digital signage and server market segment.

The Q87/H81 platform is made with 22-nanometer technology that supports Intel's first processor architecture to unite the CPU and the graphics core on the transistor level. The MB210 board utilizes the dramatic increase in performance provided this Intel's latest cutting-edge technology. The MB210 offers fast 6Gbps SATA support, USB2.0/3.0 and interfaces for RGB, DVI-D, HDMI and DP displays.

MB210 Specification:

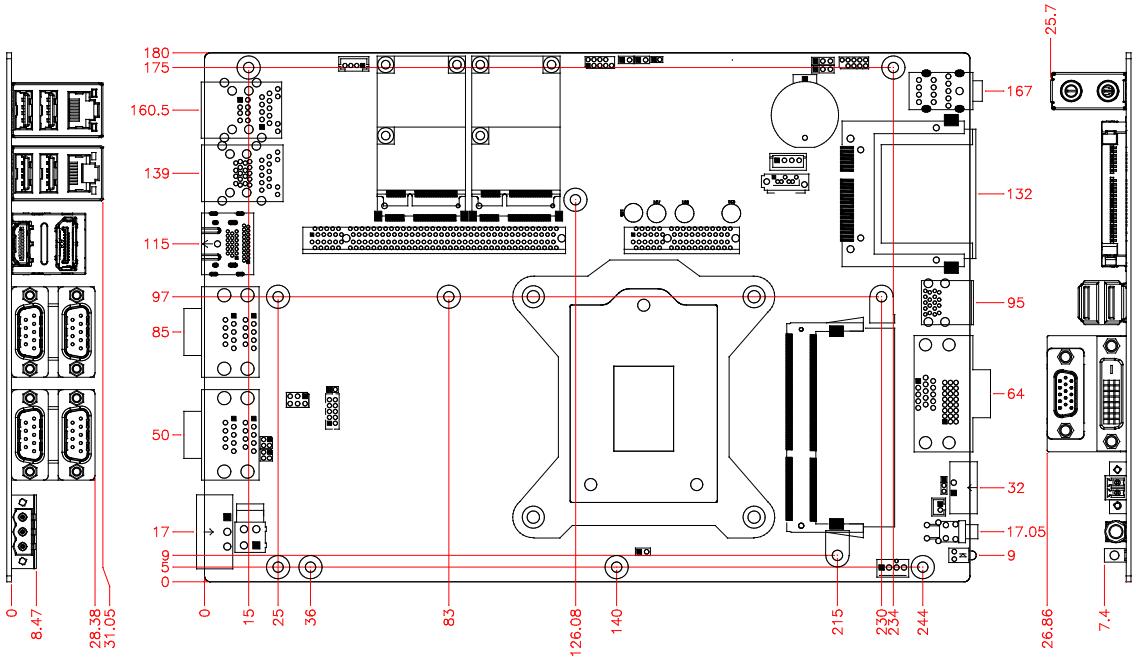
Form Factor	Customized motherboard
CPU type	- Intel® 4th Generation Desktop Core™ i7/i5/i3/Celeron DT Processor **on solder side** - Intel® Core™ i7-4770TE (2.3Ghz) TDP=45W - Intel® Core™ i5-4570TE (2.7Ghz) TDP=35W - Intel® Core™ i5-4590T (2.0Ghz) TDP=35W - Intel® Core™ i3-4350T (3.1Ghz) TDP=35W - Intel® Core™ i3-4330TE (2.4Ghz) TDP=35W - Intel® Celeron® G1820TE (2.2Ghz) TDP=35W - **Yellow = Haswell Refresh**
Chipset	Intel® Q87 PCH (**MB210AF**) Intel® H81 PCH (**MB210EF**) - 23 x 22 mm package size, 0.65mm ball pitch
Memory	- 2 x DDR3-1600 SO-DIMM 8 GB, Max. 16GB (Non-ECC) - **1x DIMM on solder side** - Dual channel DDR3-1600 MHz with 1.5V

	- SO-DIMM x 2, Max.=**16**GB (Non-ECC) [Horizontal type]
VGA	Intel® 4th Generation Core™ DT processor integrated HD Gfx, Direct X 11.1, OpenGL 3.2, Open CL 1.2 - DVI-D x 1 (Thru port B, with level shifter ASM1442K) - DisplayPort x 1 (Thru port C) - HDMI (Thru port D) - VGA x 1 (Thru PCH)
LAN	1 x Intel® I218LM GbE PHY (for MB210AF only) 1 x Intel® I218V GbE PHY (for MB210EF only) 1 x Intel® I211AT Gigabit LAN
USB	**For MB210AF Configuration** - 2 x USB**3.0** ports via the front panel I/O ** co-lay USB2.0 connector ** **UB1112C-8HS6-4F** - 2 x USB**3.0** ports via the rear panel I/O - 2 x USB2.0 ports via the rear panel I/O - 2 x USB2.0 ports via MiniPCIe socket - 2 x USB2.0 ports via PCI-E(x4) expansion slot **For MB210EF Configuration** - 2 x USB**3.0** ports via the rear panel I/O - 2 x USB2.0 ports via the rear panel I/O - 2 x USB2.0 ports via the front panel I/O ** co-lay USB3.0 connector ** - 2 x USB2.0 ports via MiniPCIe socket - 2 x USB2.0 ports via PCI-E(x4) expansion slot
Serial ATA	Intel® PCH built-in SATA controller, support 4 ports - 1 x SATAII (3Gbps) thru CFAST and 1 x SATAIII (6Gbps) thru mSATA - 1 x SATAII (3Gbps) port thru PCI-E (4x) slot - 1 x SATAIII (6Gbps) connector on board - RAID is supported [**MB210AF only**]
Audio	Intel® PCH built-in High Definition Audio controller + Realtek ALC662-CG ~~w/ 5.1 channels~~
LPC I/O	Fintek F81866AD-I (128-pin LQFP[14mm x 14 mm]) - COM#1 (RS422/RS485) supporting isolation [ACPL-M60L-500E OPTOCOUPLER] (pin9 with isolation 5V @ 150mA [TBD]) **[C01Z601L000000000P]**

	1 x DC to DC power converter @5V/2W **[C0711020050053100P]** 2 x RS422/485 transceiver SP485EEN-L **[C014485EEN0002000P]** - COM #2 (RS232 only) support ring-in with power @500 mA (selectable for 5V or 12V) - COM #3~COM #6 (RS232 only) Hardware Monitor (2 thermal inputs,4 voltage monitor inputs & 2 Fan headers) - CPU FAN x1 (PWM Fan type, 4-pins connector) - SYS FAN x1 (DC FAN type, 3-pins signal via PCI-E(x4) slot
Digital IO	4 in & 4 out
Edge Connector [*Rear Panel I/O*]	1 x RS422/485 port with isolation protection for COM#1+ 1 x RS232 port for COM#2 1 x DisplayPort + HDMI for video output **[refer to MI987]** 2 x RS232 port for COM#3/COM#4 1 x RJ45 Gigabit Ethernet port + 2 x USB3.0 ports **[C1217110307200100P]** 1 x RJ45 Gigabit Ethernet port + 2 x USB2.0 ports **[C1217110307200100P]** 1 x 3 pins terminal block for DC-input [5EHDRM-03P 90D 3 pins] **[P/N: C12165EHD03105100P]**
Edge Connectors [*Front Panel I/O*]	1 x DVI-D + 1 x VGA for video output **[refer to MI981]** 1 x Audio jack for MIC-in / Line-out **[refer to MI987]** 2 x USB3.0 ports ** co-lay USB2.0 connector ** 1 x red HDD LED 1 x power button with green PWR LED 1 x 2 pins terminal block [co-lay with power on] For external power button **[EC350RM-02P 90D 2 pins] [P/N: C1216ECH310203000P]** 1 x CFAST socket ****push-push type** P/N: C1236220024110200P**
Expansion Slots	- PCI-Express (16x PEG3.0) x1 + PCI-Express (4x) x1 - PCI-Express (4x) x1 [the customized pin definition] total 64 pins - 1 x PCI-E (1x) signal for 36 pins - 1 x SATA for 4 pins - 2 x DB9 for 4 pins [for TX/RX only] - 2 x USB for 8 pins - 1 x FAN for 3 pins - 1 x SMbus for 2 pins

	- 2x Mini PCI-E sockets [Full-sized] , [both support USB 2.0] [refer to MI808] - Support mSATA thru either one Mini-PCI-E socket
Onboard Header/Connector	2 x 5 pins DF11 box header x1 for Digital IO 1 x 4 pins [2 x 2]ATX power connector for DC-input 1 x 2 pins header for power reset button 1 x SATA III connector for SATA device (BLUE color) 1 x 4-pins power connector (JST type, For SATA device)
Watchdog Timer	Yes (256 segments, 0, 1, 2…255 sec/min)
DC Input	+12V~24V power input
Power protection	- OVP power protection (Overvoltage Protection to 60V) - UVP power protection - Reverse voltage protection (Reverse Supply Protection to –40V) - Linear LTC4365HDDB Power Supply Protection Controller - Extra power schematic **refer to IDP100**
iSMART 3.2	1. EuP / ErP (thru Super I/O) 2. Auto-scheduler 3. Power fail detector 4. Low temperature Guardian
Environment	Operation Temperature : -10~70 degree C Storage Temperature : -20~80 degree C Relative humidity : 90%, non-condensing @ 60 degree C
Certification	CE ****follow EN55032**** FCC Class B
Operation System	Windows 7, Windows 8/8.1, Linux
Board Size	170 x 170 mm (TBD)
RoHS 2.0	YES

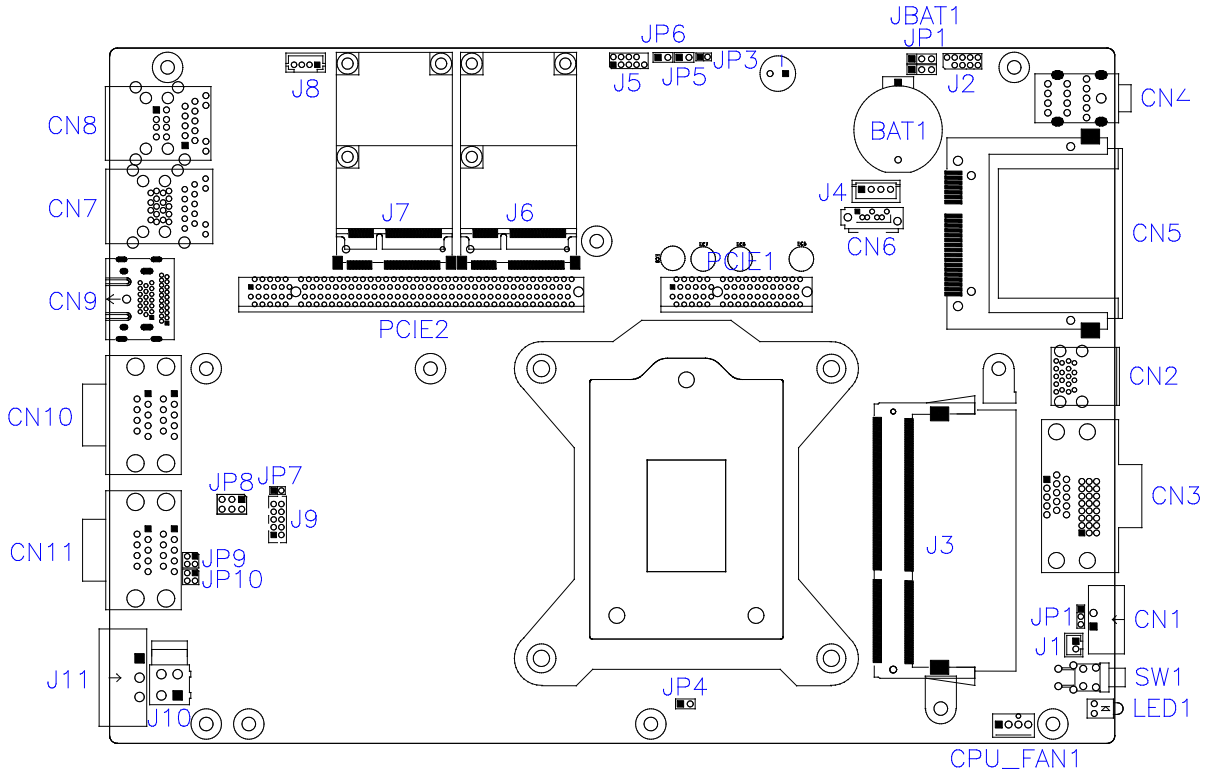
2.2 Board Dimensions



2.3 Setting the Jumpers

Jumpers are used on MB210 to select various settings and features according to your needs and applications. Contact your supplier if you have doubts about the best configuration for your needs. The following lists the connectors on MB210 and their respective functions.

2.4 Jumper Locations on MB210



JBAT1: Clear CMOS Contents

JBAT1	Setting	Function
	Pin 1-2 Short/Closed	Normal (Default)
	Pin 2-3 Short/Closed	Clear CMOS

JP1: Clear ME Contents

JP1	Setting	Function
	Pin 1-2 Short/Closed	Normal (Default)
	Pin 2-3 Short/Closed	Clear CMOS

JP6: Flash Descriptor Security Override (Factory use only)

JP6	Flash Descriptor Security Override
Open	Disabled (Default)
Close	Enabled

JP8: COM2 RS232 RI/+5V/+12V Power Setting

JP8	Setting	Function
	Pin 1-3, Short/Closed	+12V
	Pin 3-4, Short/Closed	RI (Default)
	Pin 3-5, Short/Closed	+5V

JP9: COM1Terminal Selection

JP9	Flash Descriptor Security Override
Terminal Disable	Open (Default)
Terminal Enable	Pin 1-2, Short/Closed Pin 3-4, Short/Closed

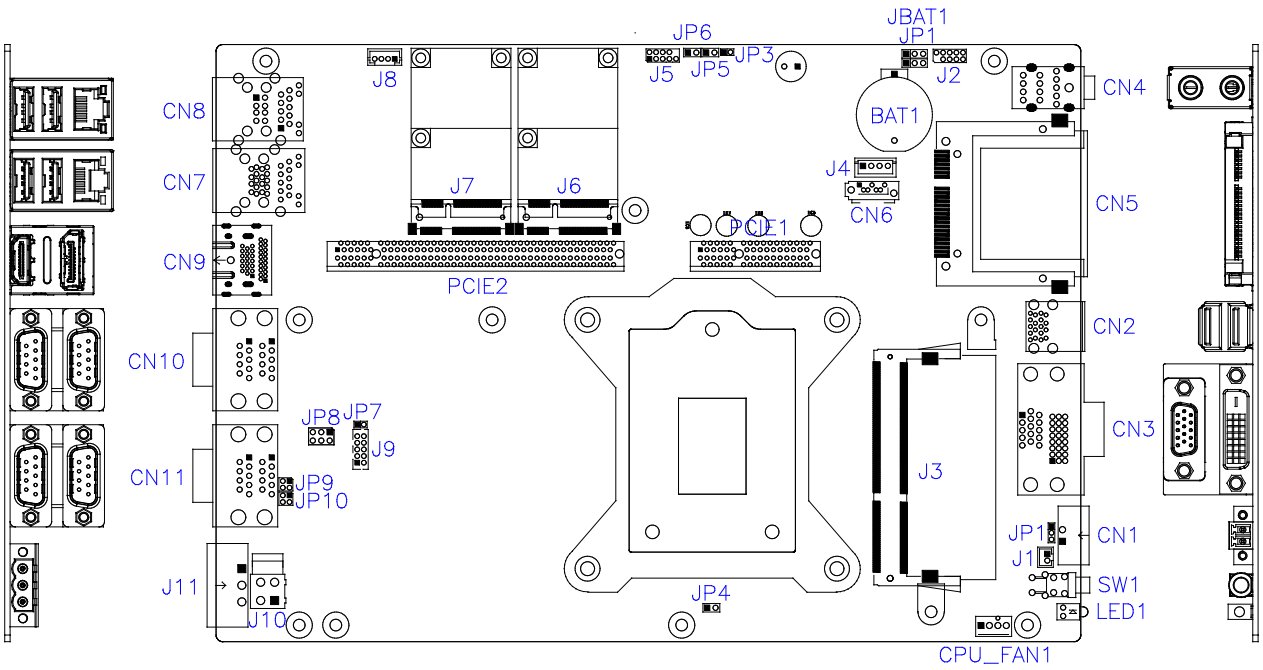
JP10: RS-422/RS-485 Selection

JP10	Flash Descriptor Security Override
RS-422	Pin 1-2, Short/Closed
RS-485	Pin 3-4, Short/Closed

JP11: AT/ATX Mode Selection

JP11	Setting	Function
	Pin 1-2 Short/Closed	ATX Mode (Default)
	Pin 2-3 Short/Closed	AT Mode

Connector Locations on MB210



CN2: USB2.0 (UB1112C-8HS6-4F)

/USB3.0 Connector (UEA1112C-8HS6-4F)

CN3: CRT + DVI-D Connector (QH11121-DBGH-4F, BX4)

CN4: Audio Connector (JA23331-HA6Q-4F (E))

CN5: CFAST Connector (CY101-1100191 v1.2)

CN6: SATA Connector (WATM-07DBN4B2B8UW4)

CN7: RJ45 + USB3.0 Connector (JFM38U1B-B313-4F)

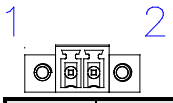
CN8: RJ45 + USB2.0 Connector (JFM38U1B-21U5-4F)

CN9: DP + HDMI Connector (3VD11203-HHJ0-4H)

CN10: COM3/4 Connector (40909AANSNAR)

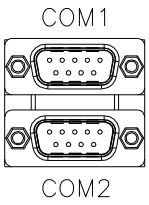
Note: COM3 and COM4 support RS232 only.

CN1: Power Button and Power on LED Connector (DINKLE_ECH350RM-02P)



Pin #	Signal Name
1	Power BTN
2	Ground

CN11: COM1/2 Connector (40909AANSNAR)

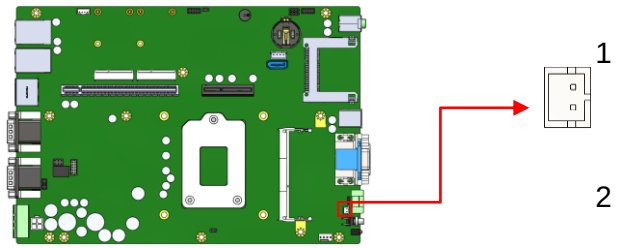


Pin #	Signal Name		
	RS-232	R2-422	RS-485
1	DCD	TX-	DATA-
2	RX	TX+	DATA+
3	TX	RX+	NC
4	DTR	RX-	NC
5	Ground	Ground	Ground
6	DSR	NC	NC
7	RTS	NC	NC
8	CTS	NC	NC
9	RI	NC	NC
10	NC	NC	NC

Note: COM1 supports Isolated RS422/RS485 only.

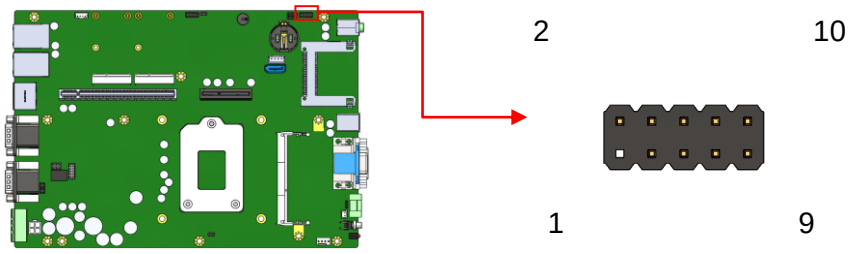
COM2 supports RS232 only.

J1: Reset Button Connector (Techbest 2001-WS-02-LF)



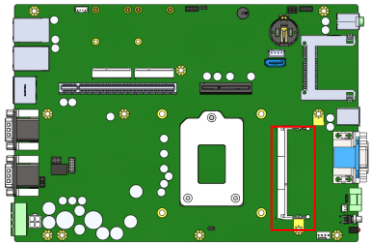
Pin #	Signal Name
1	Reset BTN
2	Ground

J2: SPI Flash Connector (Factory use only) (2mm)

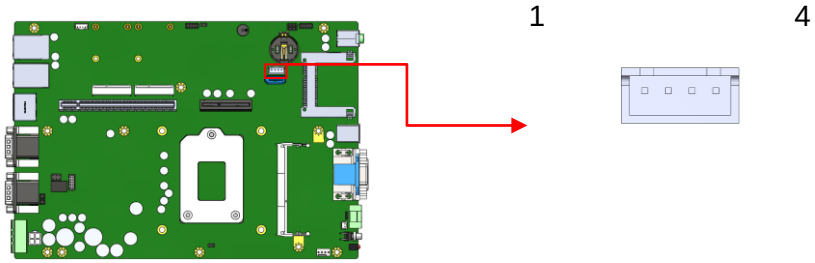


Signal Name	Pin #	Pin #	Signal Name
Protect Pin	X	2	NC
SPI_CS#	3	4	+3.3V
SPI_SO	5	6	SPI_HOLD#
SPI_WP#	7	8	SPI_CLK
Ground	9	10	SPI_SI

J3, J12: DDR3 SO-DIMM Socket

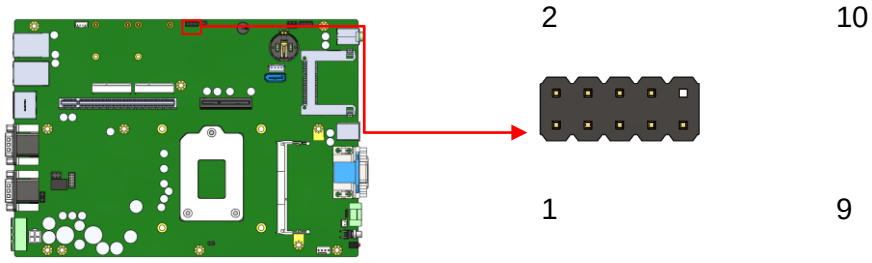


J4: SATA Power Connector (1600-4SD)



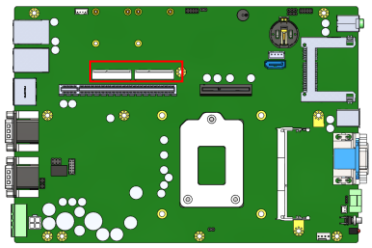
Pin #	Signal Name
1	+5V
2	Ground
3	Ground
4	+12V

J5: LPC Debug Connector (Factory use only) (2mm)

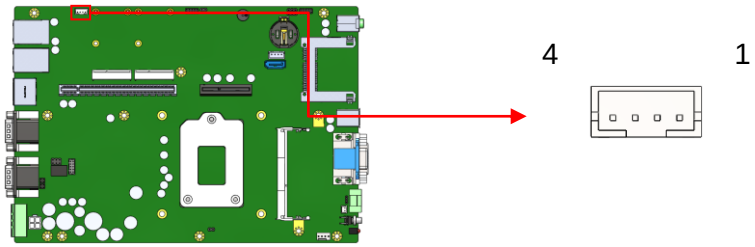


Signal Name	Pin #	Pin #	Signal Name
LPC_AD0	1	2	Reset#
LPC_AD1	3	4	LPC_FRAME#
LPC_AD2	5	6	+3.3V
LPC_AD3	7	8	Ground
CLK_33MHz	9	X	Protect Pin

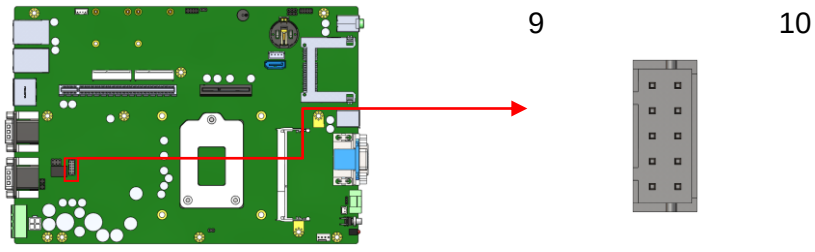
J6, J7: Mini PCIE Connector (Foxconn AS0B226-S99Q-7H)



J8: iSMART Debug Connector (Factory use only) (E-CALL 0110-161-040)

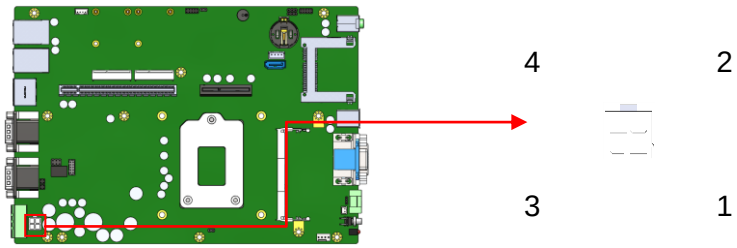


J9: Digital I/O Connector (豪國DF11-10S-PA66H)



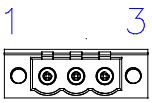
Signal Name	Pin #	Pin #	Signal Name
Ground	1	2	VCC5
OUT3	3	4	OUT1
OUT2	5	6	OUT0
IN3	7	8	IN1
IN2	9	10	IN0

J10: DC-in Connector (4M-ATX-S)



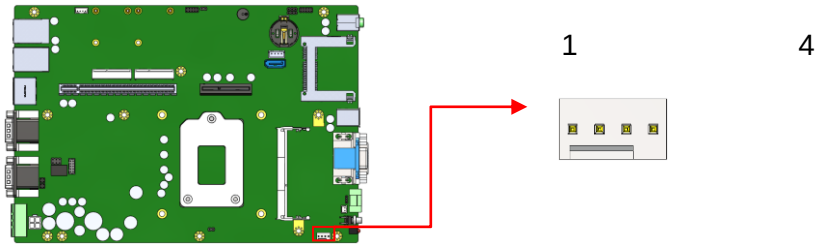
Pin #	Signal Name
1	Power Ground
2	Case Ground
3	+12V to +24V
4	+12V to +24V

J11: DC-inN Connector (DINKLE_5EHDRM-03P)



Pin #	Signal Name
1	+12V to +24V
2	Case Ground
3	Power Ground

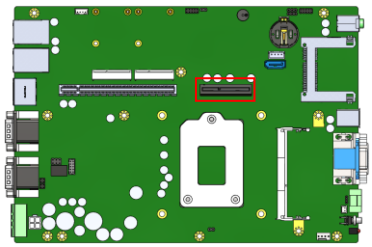
CPU_FAN1: CPU Fan Power Connector (HF27040-M1)



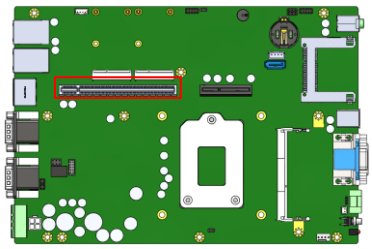
Pin #	Signal Name
1	Ground
2	+12V
3	Rotation detection
4	Control

LED1: HDD Active LED

PCIE1: Include PCI-E x1, USB2.0, SYS_FAN, SATA, COM TX/RX Signal Connector



PCIE2: PCI-E x16 Connector



CHAPTER 3 BIOS SETUP

This chapter describes the different settings available in the AMI BIOS that comes with the board. The topics covered in this chapter are as follows:

BIOS Introduction

The BIOS (Basic Input/Output System) installed in your computer system's ROM supports Intel processors. The BIOS provides critical low-level support for a standard device such as disk drives, serial ports and parallel ports. It also password protection as well as special support for detailed fine-tuning of the chipset controlling the entire system.

BIOS Setup

The BIOS provides a Setup utility program for specifying the system configurations and settings. The BIOS ROM of the system stores the Setup utility. When you turn on the computer, the BIOS is immediately activated. Pressing the <Del> key immediately allows you to enter the Setup utility. If you are a little bit late pressing the <Del> key, POST (Power On Self Test) will continue with its test routines, thus preventing you from invoking the Setup. If you still wish to enter Setup, restart the system by pressing the "Reset" button or simultaneously pressing the <Ctrl>, <Alt> and <Delete> keys. You can also restart by turning the system Off and back On again. The following message will appear on the screen:

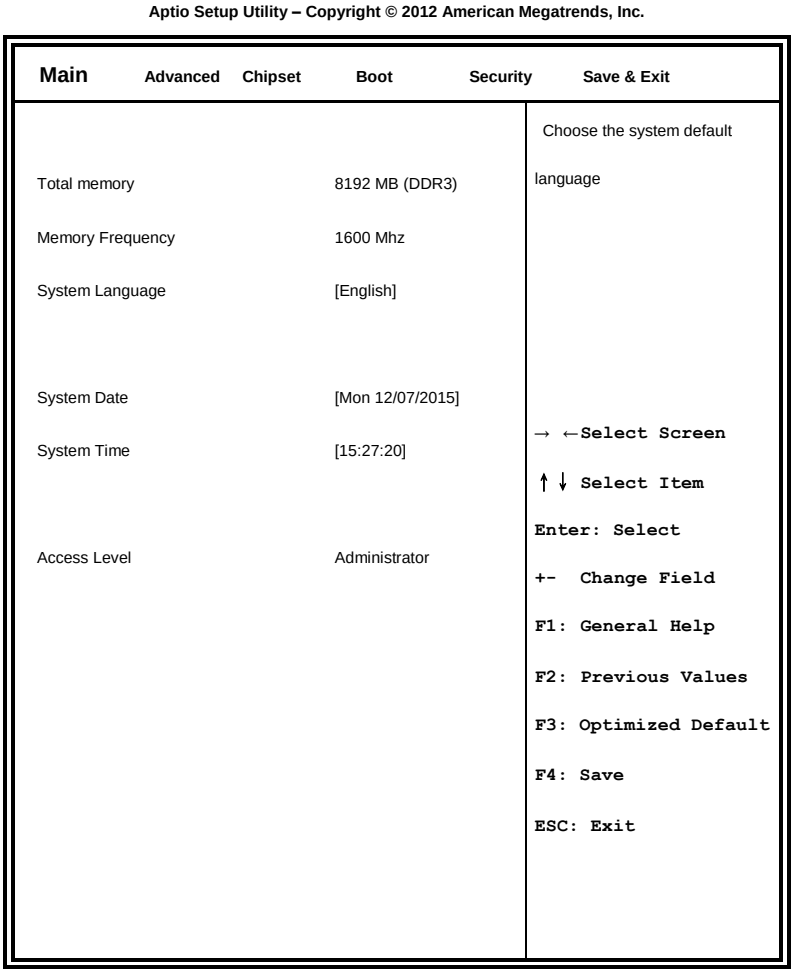
```
Press  <DEL> or <F2> to  Enter  Setup
```

In general, you press the arrow keys to highlight items, <Enter> to select, the <PgUp> and <PgDn> keys to change entries, <F1> for help and <Esc> to quit.

When you enter the Setup utility, the Main Menu screen will appear on the screen. The Main Menu allows you to select from various setup functions and exit choices.

Warning: *It is strongly recommended that you avoid making any changes to the chipset defaults. These defaults have been carefully chosen by both AMI and your system manufacturer to provide the absolute maximum performance and reliability. Changing the defaults could cause the system to become unstable and crash in some cases.*

Main Settings



System Language

Choose the system default language.

System Date

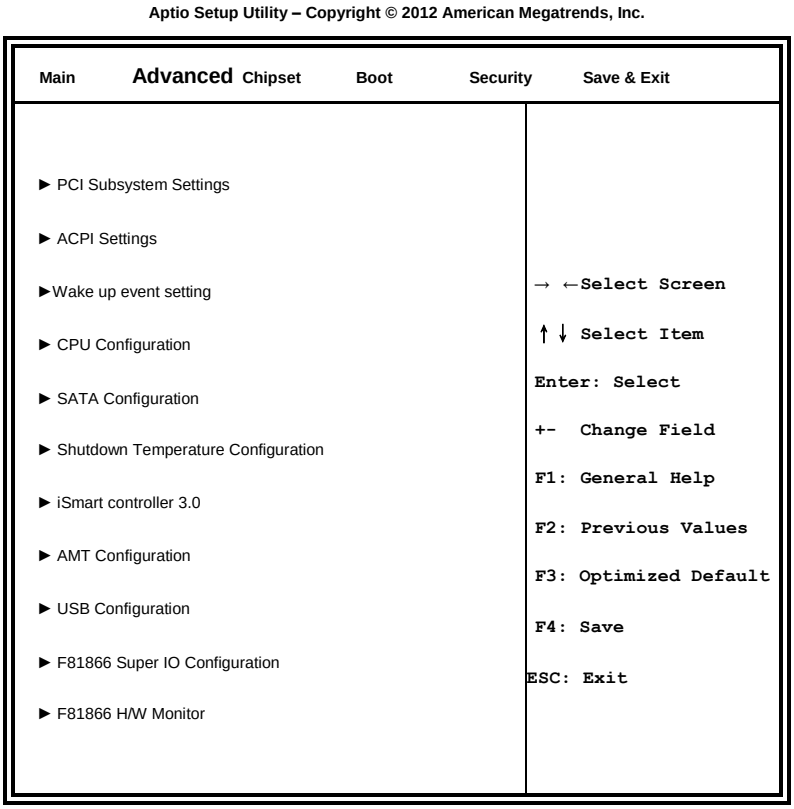
Set the Date. Use Tab to switch between Data elements.

System Time

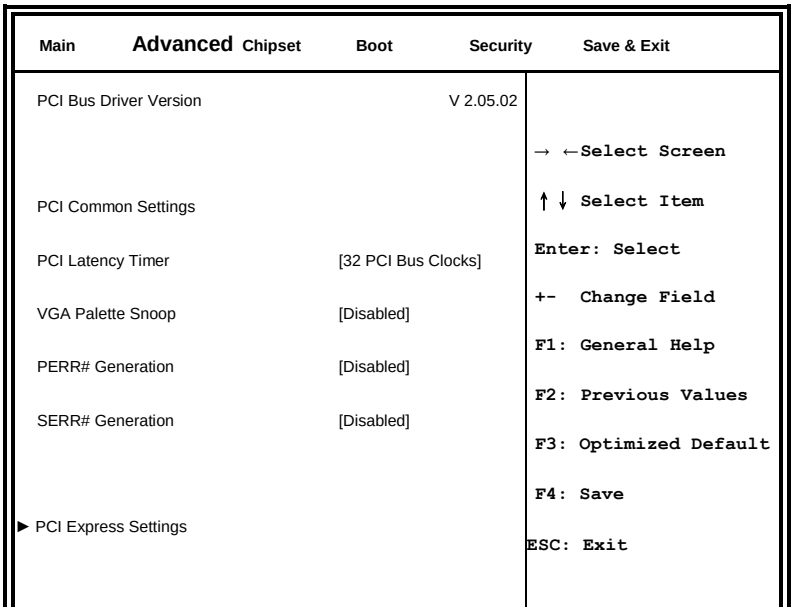
Set the Time. Use Tab to switch between Time elements.

Advanced Settings

This section allows you to configure and improve your system and allows you to set up some system features according to your preference.



PCI Subsystem Settings



PCI Latency Timer

Value to be programmed into PCI Latency Timer Register

VGA Palette Snoop

Enables or Disables VGA Palette Register Snooping.

PERR# Generation

Enables or Disables PCI Device to Generate PERR#.

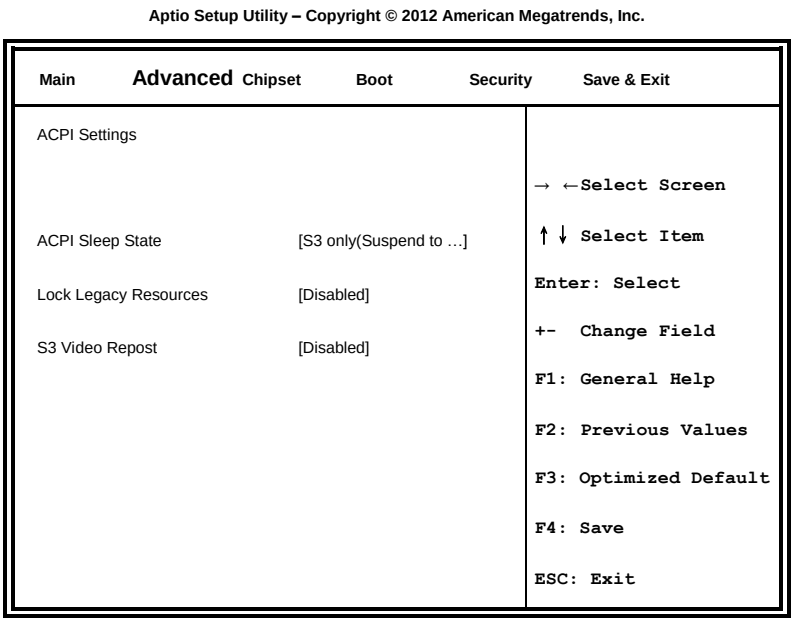
SERR# Generation

Enables or Disables PCI Device to Generate SERR#.

PCI Express Settings

Change PCI Express Devices Settings.

ACPI Settings



ACPI Sleep State

Select ACPI sleep state the system will enter, when the SUSPEND button is pressed.

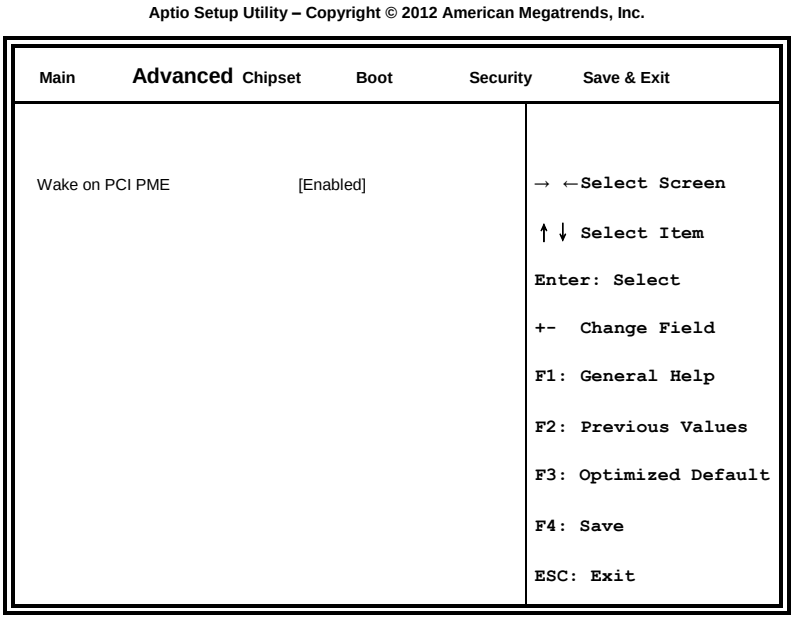
Lock Legacy Resources

Enables or Disables Lock of Legacy Resources.

S3 Video Repost

Enables or Disables S3 Video Repost.

Wake up event Settings

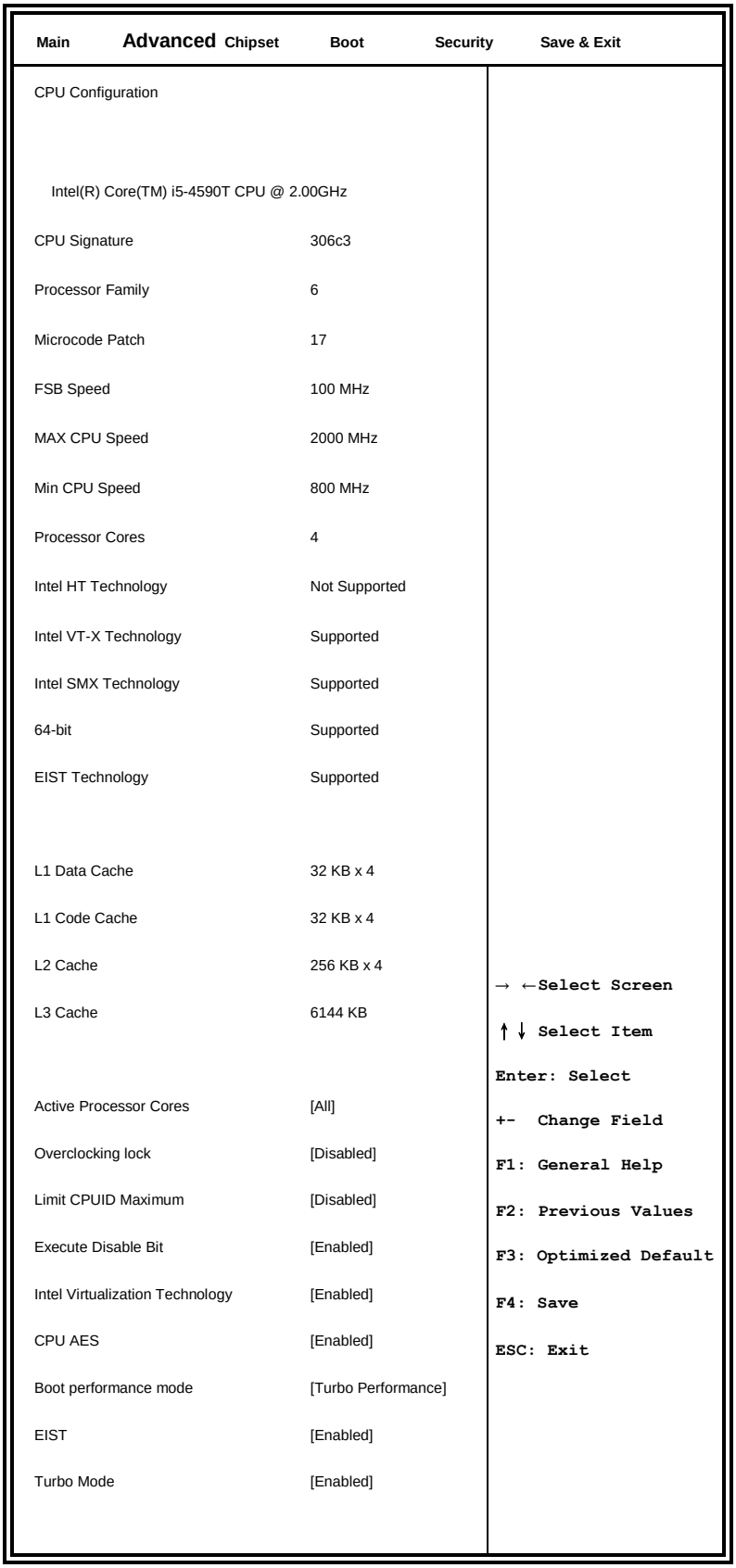


Wake on PCI PME

Enables or Disables Wake on PCI PME.

CPU Configuration

This section shows the CPU configuration parameters.



Main **Advanced** Chipset Boot Security Save & Exit

CPU Configuration

Intel(R) Core(TM) i5-4590T CPU @ 2.00GHz

CPU Signature	306c3
Processor Family	6
Microcode Patch	17
FSB Speed	100 MHz
MAX CPU Speed	2000 MHz
Min CPU Speed	800 MHz
Processor Cores	4
Intel HT Technology	Not Supported
Intel VT-X Technology	Supported
Intel SMX Technology	Supported
64-bit	Supported
EIST Technology	Supported
L1 Data Cache	32 KB x 4
L1 Code Cache	32 KB x 4
L2 Cache	256 KB x 4
L3 Cache	6144 KB
Active Processor Cores	[All]
Overclocking lock	[Disabled]
Limit CPUID Maximum	[Disabled]
Execute Disable Bit	[Enabled]
Intel Virtualization Technology	[Enabled]
CPU AES	[Enabled]
Boot performance mode	[Turbo Performance]
EIST	[Enabled]
Turbo Mode	[Enabled]

→ ←Select Screen

↑↓ Select Item

Enter: Select

+- Change Field

F1: General Help

F2: Previous Values

F3: Optimized Default

F4: Save

ESC: Exit

Active Processor Cores

Number of cores to enable in each processor package.

Overclocking lock

FLEX_RATIO(194) MSR.

Limit CPUID Maximum

Disabled for Windows XP.

Execute Disable Bit

XD can prevent certain classes of malicious buffer overflow attacks
When combined with a supporting OS(Windows Server 2003 SP1,
Windows XP SP2, SuSE Linux 9.2, RedHat Enterprise 3 update3.)

Intel Virtualization Technology

When enabled, a VMM can utilize the additional hardware capabilities
Provided by Vanderpool Technology.

CPU AES

Enable/Disable CPU Advanced Encryption Standard instructions.

Boot performance mode

Select the performance state that the BIOS will set before OS handoff.

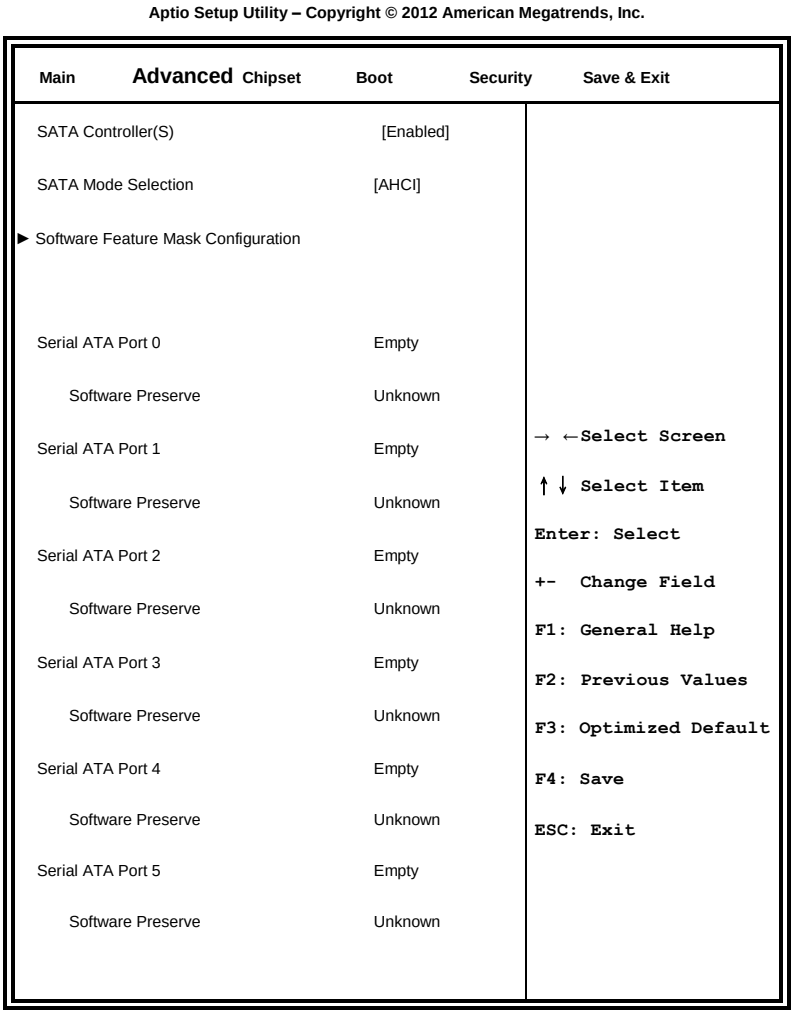
EIST

Enable/Disable Intel SpeedStep

Turbo Mode

Enable/Disable Turbo Mode.

SATA Configuration



SATA Controller(S)

Enable or disable SATA Device.

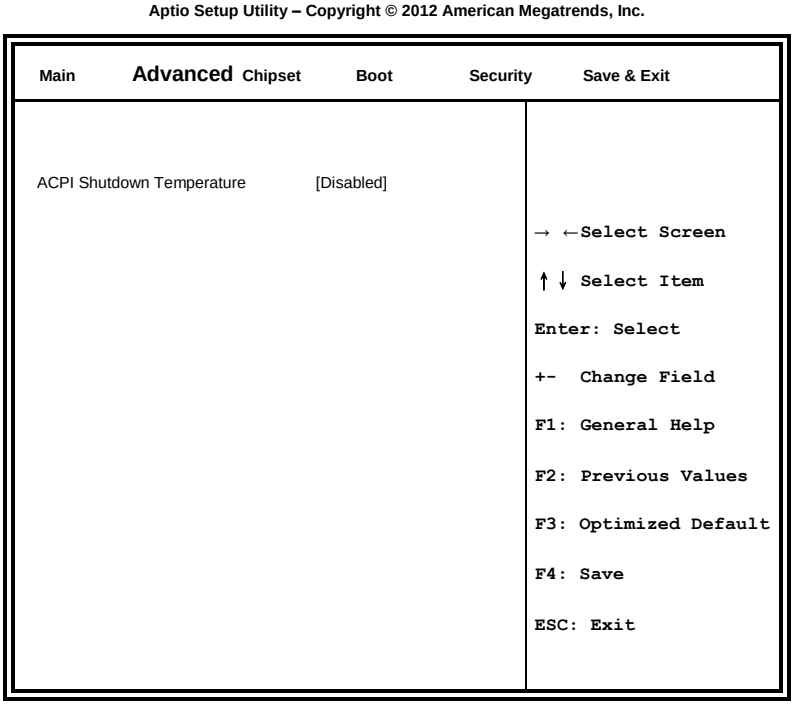
SATA Mode Selection

Determines how SATA controller(s) operate.

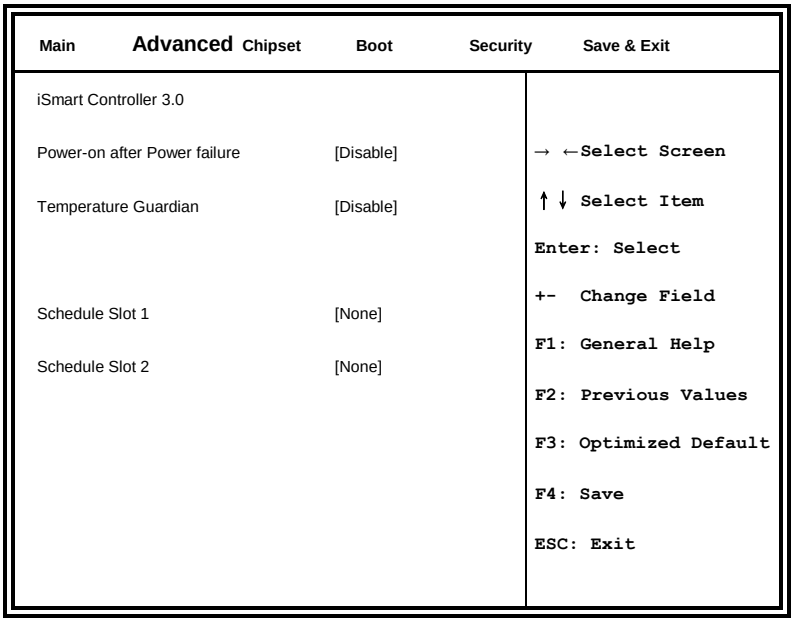
Software Feature Mask Configuration

RAID OROM/RST driver will refer to the SWFM configuration to enable or disable the storage features.

Shutdown Temperature Configuration



iSmart Controller 3.0



Power-on after Power Failure

Enable or Disable Power-on after Power failure.

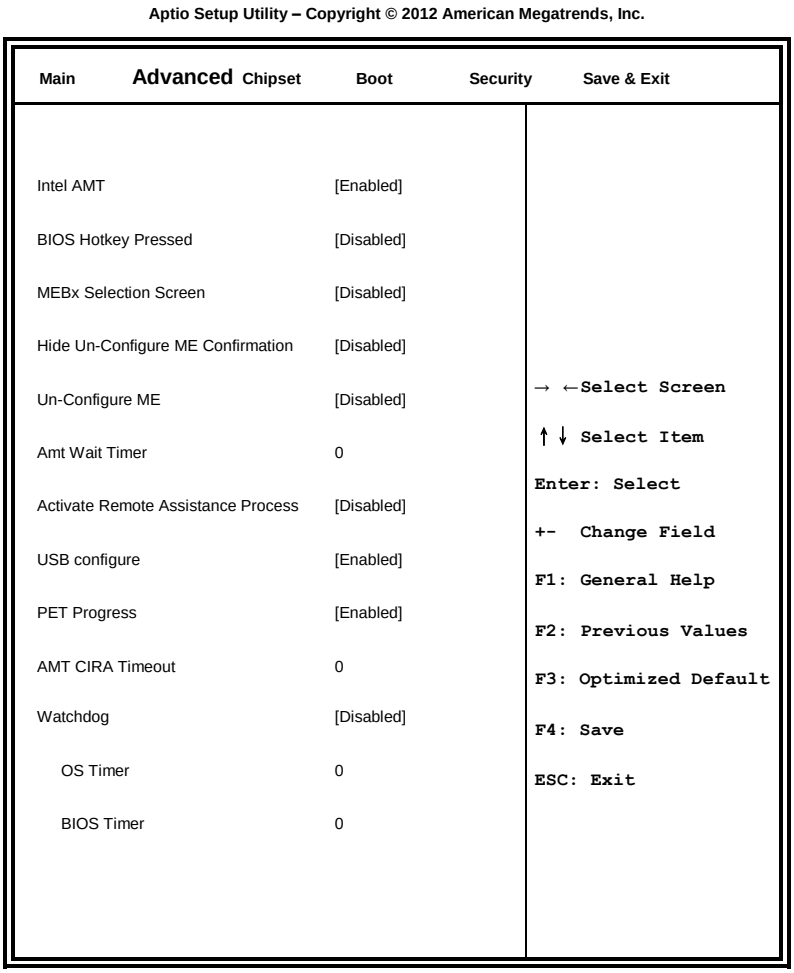
Temperature Guardian

Enable or Disable Temperature Guardian.

Schedule Slot

Setup the hour/minute for system power on.

AMT Configuration



AMT Configuration

This configuration is supported only with MB210AF(with iAMT function).

Intel AMT

Enable/Disable Intel (R) Active Management Technology BIOS Extension.

Note: iAMT H/W is always Enabled.

This option just controls the BIOS extension execution.

If enabled, this requires additional firmware in the SPI device.

BIOS Hotkey Pressed

OEMFLag Bit 1: Enable/Disable BIOS hotkey press.

MEBx Selection Screen

OEMFLag Bit 2: Enable/Disable MEBx Selection Screen.

Hide Un-Configure ME Confirmation

OEMFLag Bit 6: Hide Un-Configure ME without password Confirmation Prompt.

Un-Configure ME

OEMFLag Bit 15: Un-Configure ME without password.

Amt Wait Timer

Set timer to wait before sending ASF_GET_BOOT_OPTIONS.

Activate Remote Assistance Process

Trigger CIRA boot.

USB configure

Enable/Disable USB Configure function.

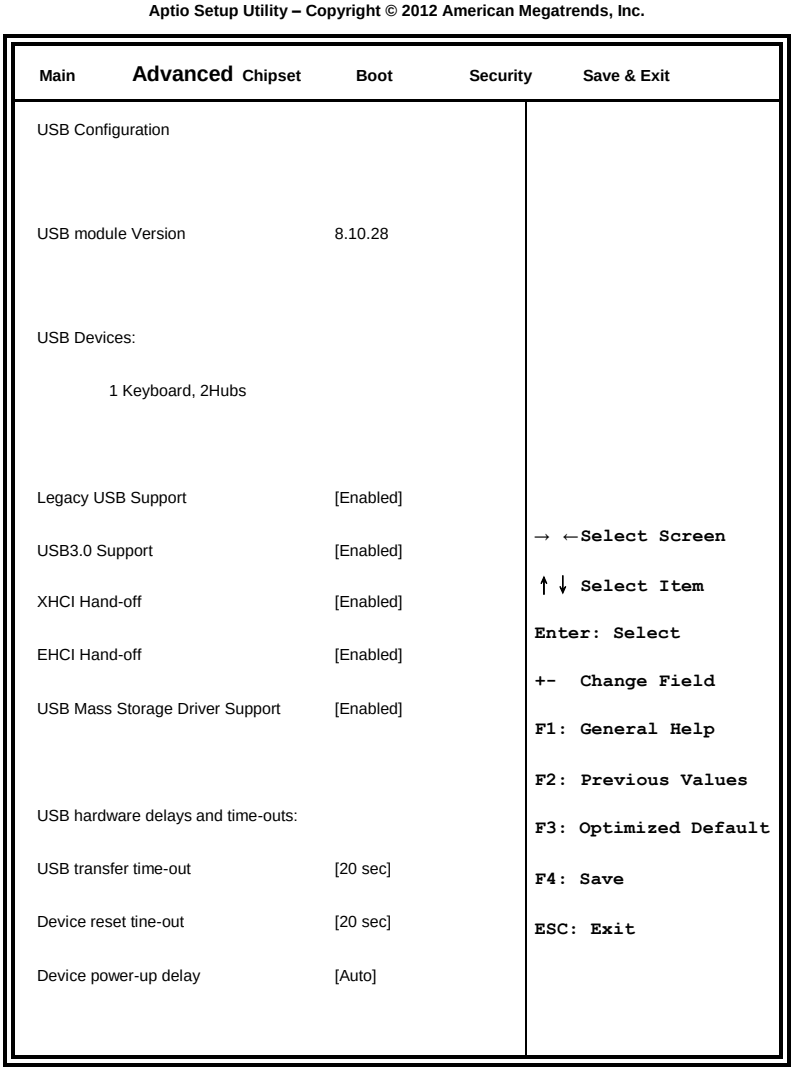
PET Progress

User can Enable/Disable PET Events progress to receive PET events or not.

Watchdog

Enable/Disable Watchdog Timer

USB Configuration



Legacy USB Support

Enables Legacy USB support.

AUTO option disables legacy support if no USB devices are connected.

DISABLE option will keep USB devices available only for EFI applications.

USB3.0 Support

Enable/Disable USB 3.0 (XHCI) Controller support.

XHCI Hand-off

This is a workaround for OSes without XHCI hand-off support. The XHCI ownership change should be claimed by XHCI driver.

EHCI Hand-off

This is a workaround for OSes without EHCI hand-off support. The EHCI ownership change should be claimed by EHCI driver.

USB MASS Storage Driver Support

Enable/Disable USB Mass Storage Driver Support.

USB Transfer time-out

The time-out value for Control, Bulk, and Interrupt transfers.

Device reset time-out

USB mass storage device start unit command time-out.

Device power-up delays

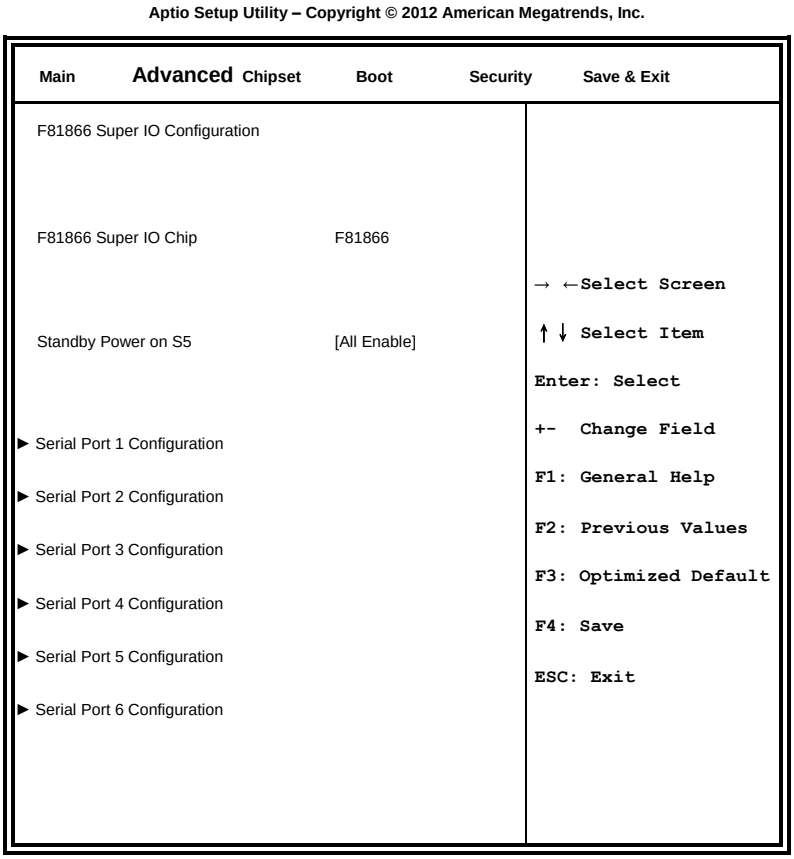
Maximum time the device will take before it properly

Reports itself to the host controller.

'Auto' uses default value: for a Root port it is 100 ms,

For a Hub port the delay is taken form Hub descriptor.

F81866 Super IO Configuration



Standby Power on S5

This function is supported only with MB210EF(with EuP/ErP function).

Serial Port 1 Configuration

Set parameters of Serial Port 0 (COMA)

Serial Port 2 Configuration

Set parameters of Serial Port 1 (COMB)

Serial Port 3 Configuration

Set parameters of Serial Port 1 (COMC)

Serial Port 4 Configuration

Set parameters of Serial Port 1 (COMD)

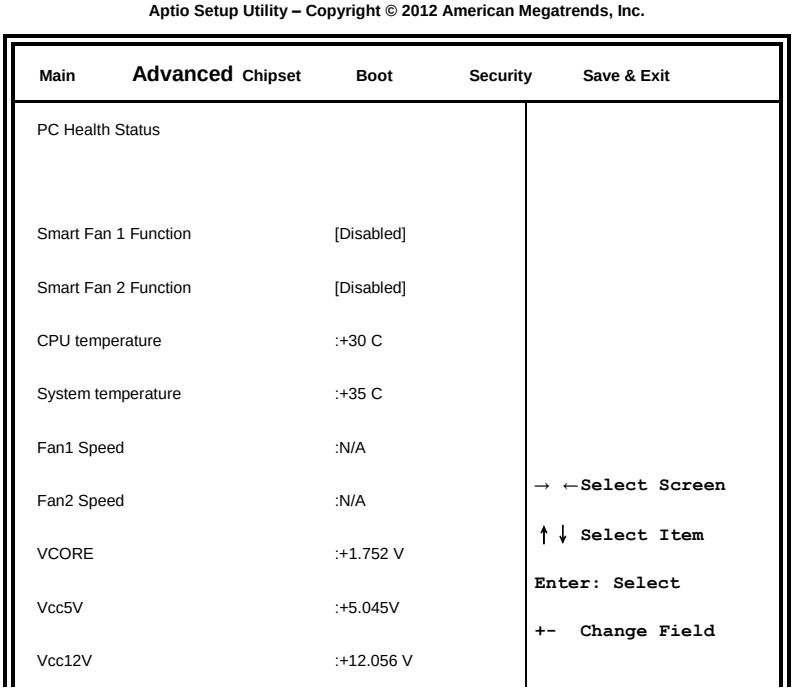
Serial Port 5 Configuration

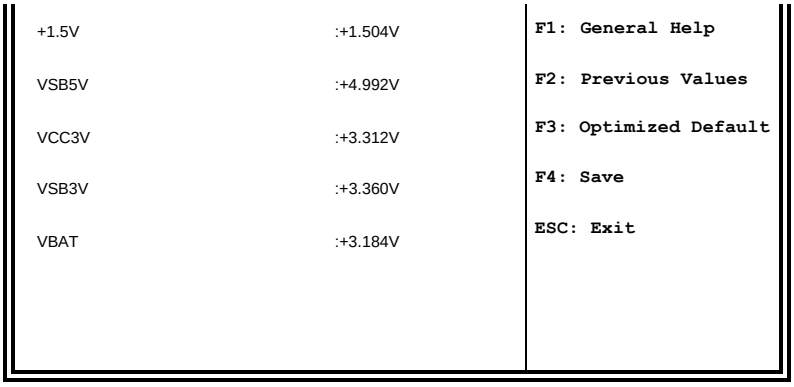
Set parameters of Serial Port 1 (COME)

Serial Port 6 Configuration

Set parameters of Serial Port 1 (COMF)

F81866 H/W Monitor



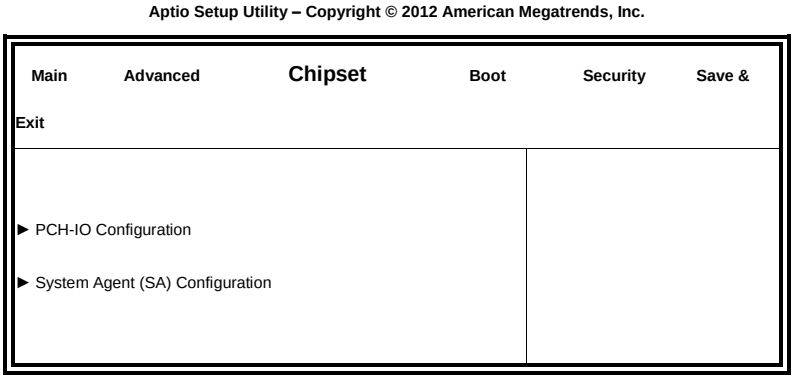


Smart Fan Function

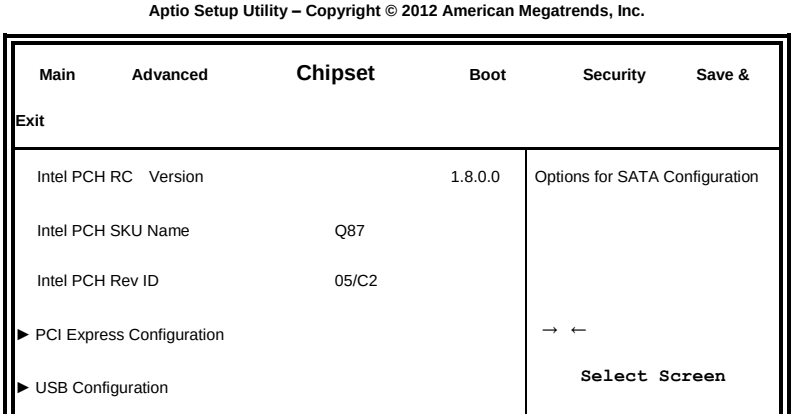
Smart Fan Mode Select.

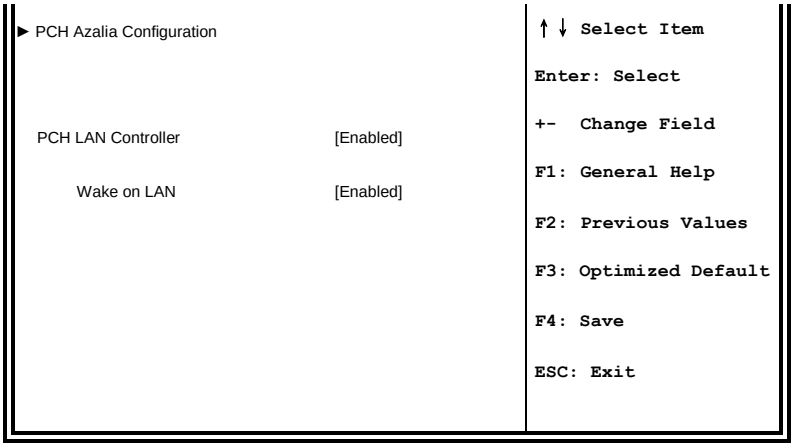
Chipset Settings

This section allows you to configure and improve your system and allows you to set up some system features according to your preference.



PCH-IO Configuration





PCI Express Configuration

PCI Express Configuration settings.

USB Configuration

USB Configuration settings.

PCH Azalia Configuration

PCH Azalia Configuration settings.

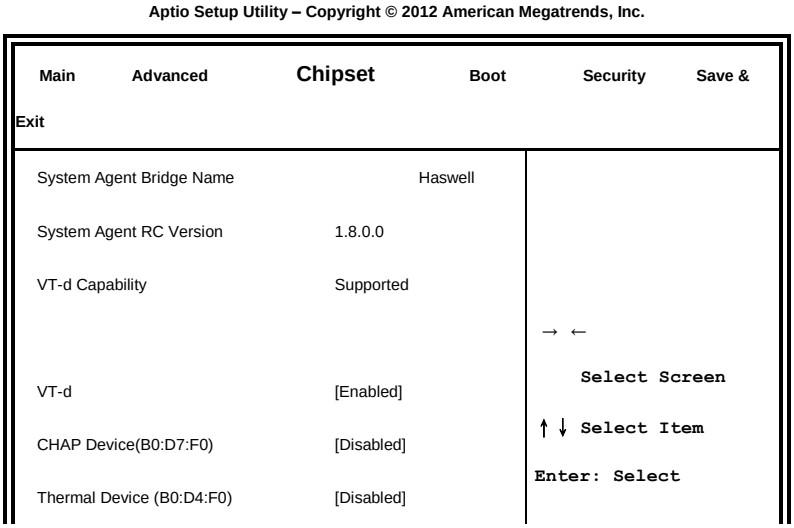
PCH LAN Controller

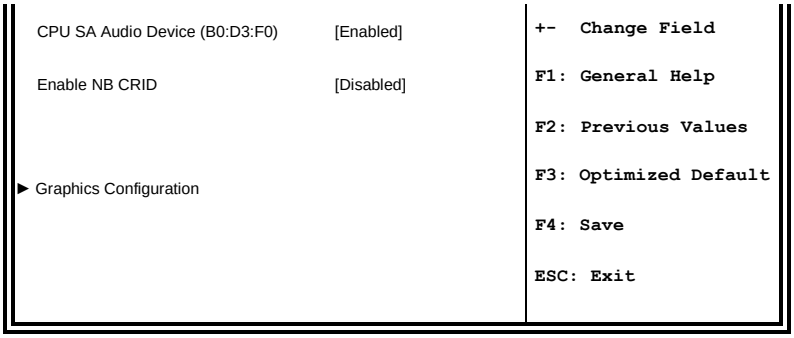
Enable of disable onboard NIC.

Wake on LAN

Enable of disable integrated LAN to wake the system.(The Wake on LAN cannot be disabled if ME is on at Sx state.)

System Agent (SA) Configuration





VT-d

Check to enable VT-d function on MCH.

CHAP Device (B0:D7:F0)

Enable or disable SA CHAP Device.

Thermal Device (B0:D4:F0)

Enable or disable SA Thermal Device.

CPU SA Audio Device (B0:D3:F0)

Enable or disable CPU SA Audio Device

Enable NB CRID

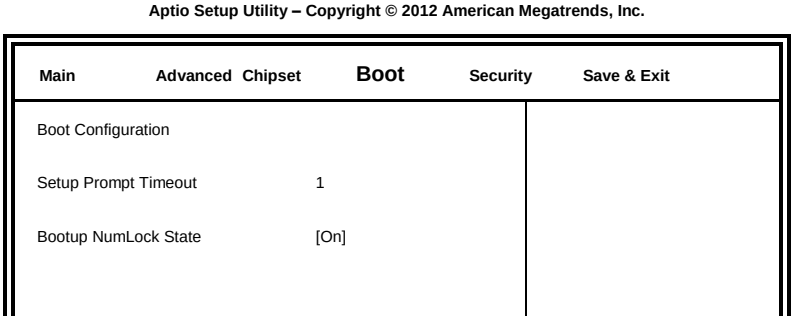
Enable or disable NB CRID WorkAround.

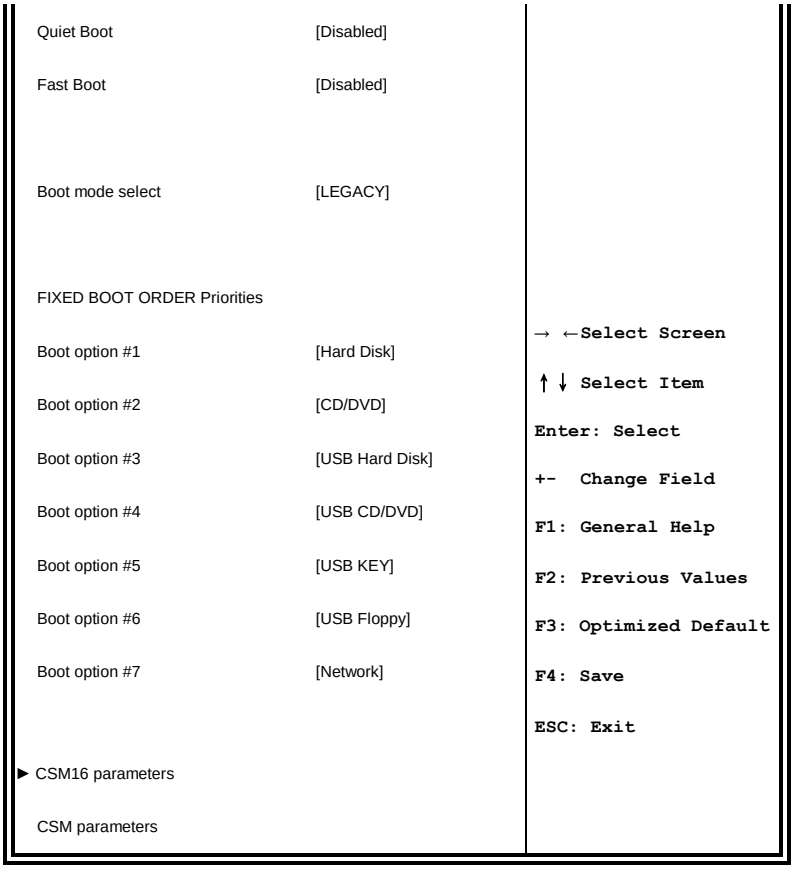
Graphics Configuration

Config Graphics Settings.

Boot Settings

This section allows you to configure the boot settings.





Setup Prompt Timeout

Number of seconds to wait for setup activation key.

65535(0xFFFF) means indefinite waiting.

Bootup NumLock State

Select the keyboard NumLock state.

Quiet Boot

Enables or Disables Quiet Boot option.

Fast Boot

Enables or Disables boot with initialization of a minimal set of devices required to launch active boot option. Has no effect for BBS boot options.

Boot mode select

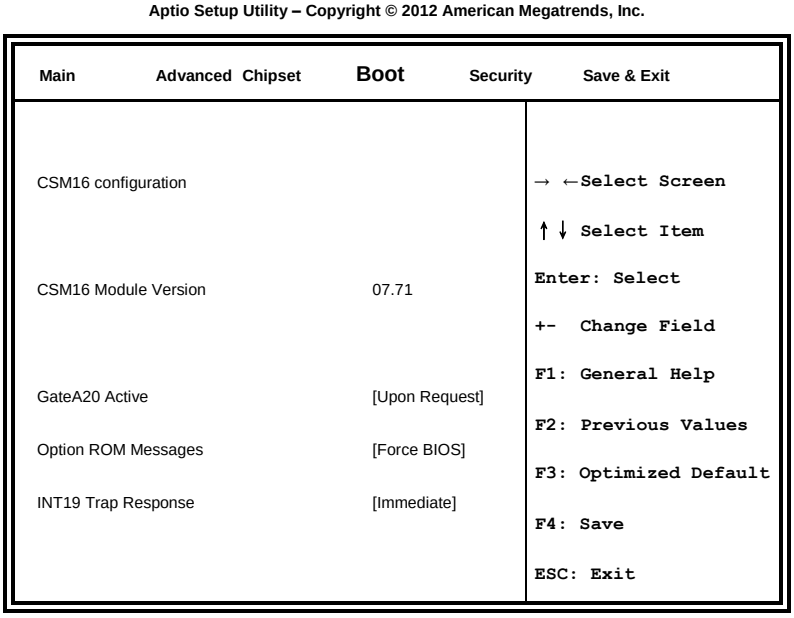
Select boot mode LEGACY/UEFI

Boot Option Priorities

Sets the system boot order.

CSM16 parameters

CSM16 configuration Enable/Disable, Option ROM execution settings,etc.



GateA20 Active

UPON REQUEST – GA20 can be disabled using BIOS services.

ALWAYS – do not allow disabling GA20; this option is useful when

any RT code is executed above 1MB

Option ROM Messages

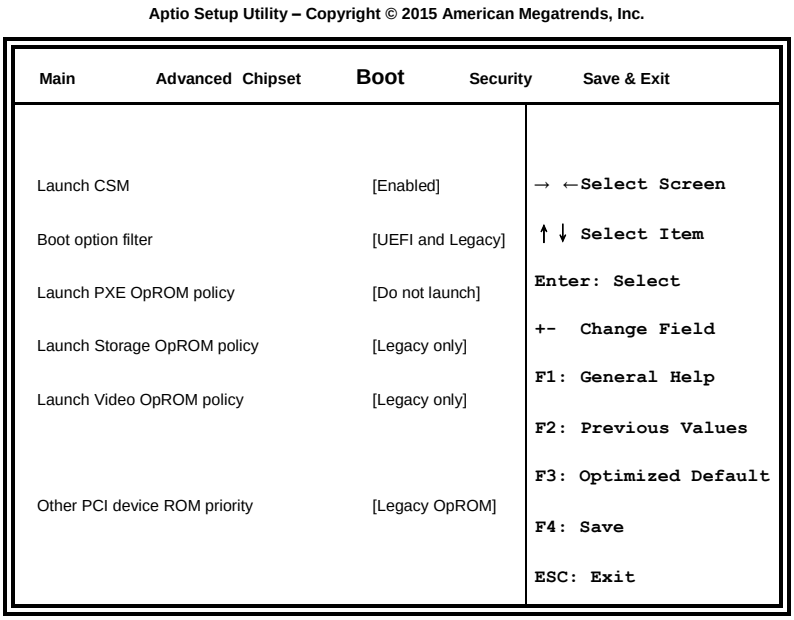
Set display mode for Option ROM

INT19 Trap Response

BIOS reaction on INT19 trapping by Option ROM: IMMEDIATE – execute the trap right away ; POSTPONED – execute the trap during legacy boot.

CSM parameters

OpROM execution, boot options filter, etc.



Launch CSM

This option controls if CSM will be launched.

Boot option filter

This option controls what devices system can boot to.

Launch PXE OpROM policy

Controls the execution of UEFI and Legacy PXE OpROM.

Launch Storage OpROM policy

Controls the execution of UEFI and Legacy Storage OpROM.

Launch Video OpROM policy

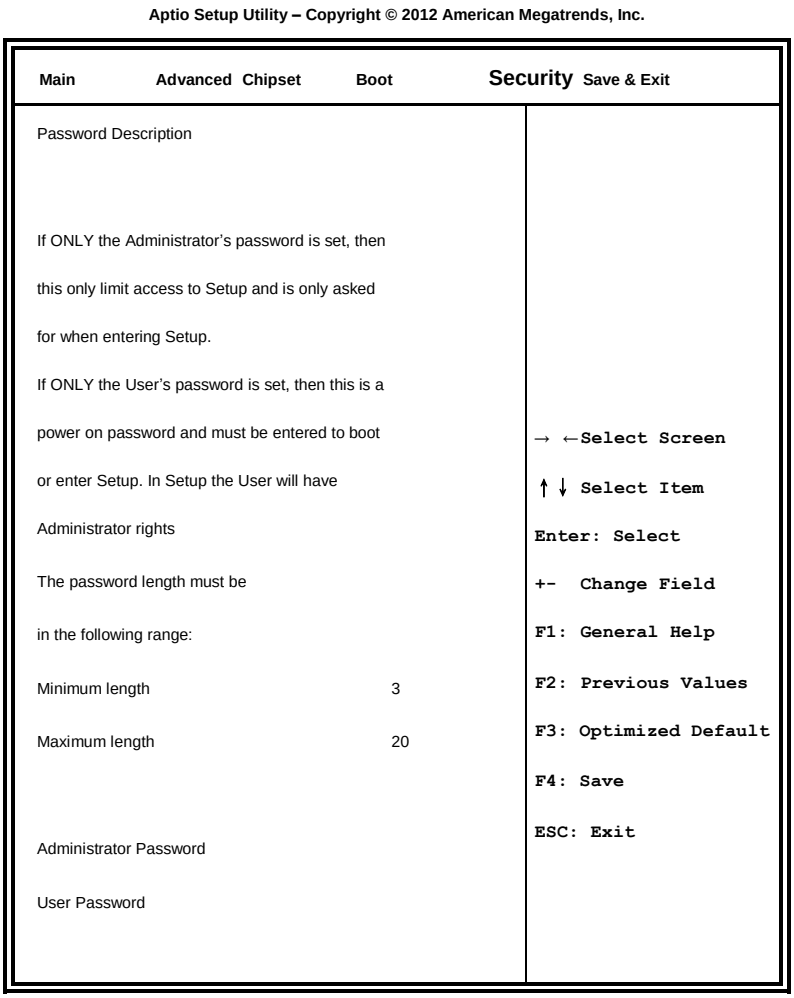
Controls the execution of UEFI and Legacy Video OpROM.

Other PCI device ROM priority

For PCI devices other than Network, Mass storage or Video defines which OpROM to launch.

Security Settings

This section allows you to configure and improve your system and allows you to set up some system features according to your preference.



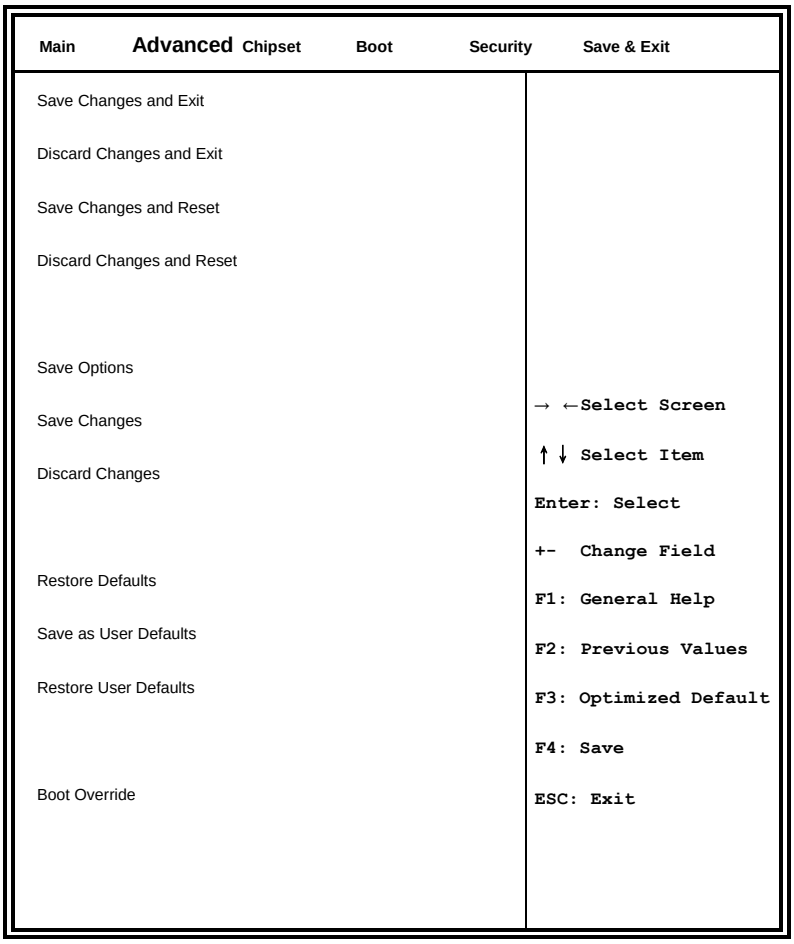
Administrator Password

Set Setup Administrator Password.

User Password

Set User Password.

Save & Exit Settings



Save Changes and Exit

Exit system setup after saving the changes.

Discard Changes and Exit

Exit system setup without saving any changes.

Save Changes and Reset

Reset the system after saving the changes.

Discard Changes and Reset

Reset system setup without saving any changes.

Save Changes

Save Changes done so far to any of the setup options.

Discard Changes

Discard Changes done so far to any of the setup options.

Restore Defaults

Restore/Load Defaults values for all the setup options.

Save as User Defaults

Save the changes done so far as User Defaults.

Restore User Defaults

Restore the User Defaults to all the setup options.

CHAPTER 4 DRIVERS INSTALLATION

This section describes the installation procedures for software and drivers. The software and drivers are included with the motherboard. If you find the items missing, please contact the vendor where you made the purchase.

IMPORTANT NOTE:

After installing your Windows operating system, you must install first the Intel Chipset Software Installation Utility before proceeding with the drivers installation.

4.1 Intel Chipset Software Installation Utility

The Intel Chipset Drivers should be installed first before the software drivers to enable Plug & Play INF support for Intel chipset components. Follow the instructions below to complete the installation

1.Insert the DVD that comes with the board. Click Intel and then Intel(R) 8 Series Chipset Drivers.

2. Click ***Intel(R) Chipset Software Installation Utility***

3. When the Welcome screen to the Intel® Chipset Device Software appears, click ***Next*** to continue.

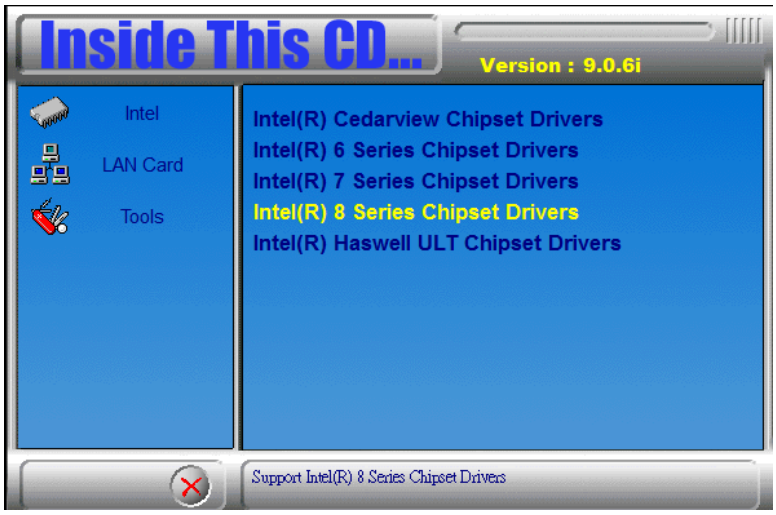
4. Click ***Yes*** to accept the software license agreement and proceed with the installation process.

5. On the Readme File Information screen, click ***Next*** to continue the installation.

6. The Setup process is now complete. Click ***Finish*** to restart the computer and for changes to take effect.

4.2 VGA Drivers Installation

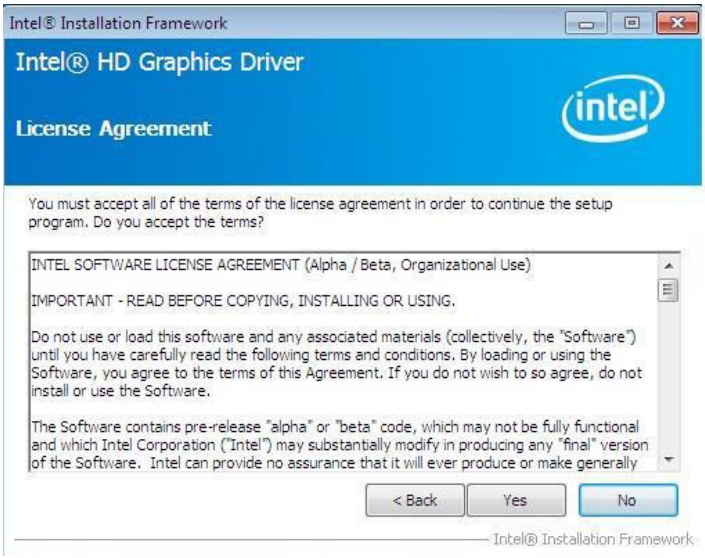
1.Insert the DVD that comes with the board. Click ***Intel*** and then ***Intel(R) 8 Series Chipset Drivers***.



2. Click ***Intel(R) HD Graphics Driver.***

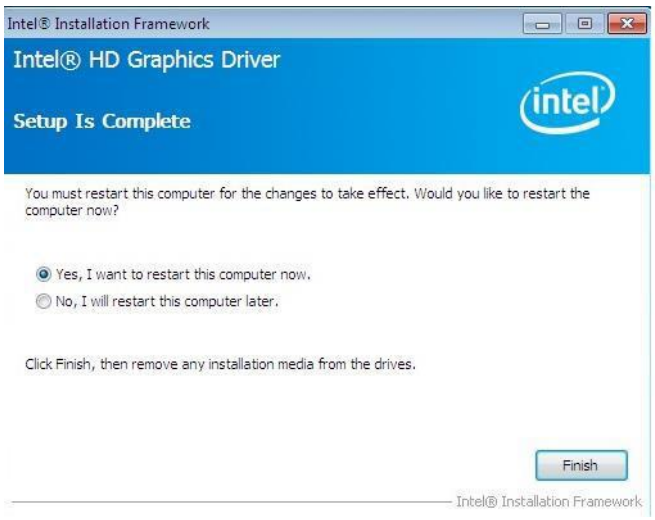
3. When the Welcome screen appears, click ***Next*** to continue.

4. Click ***Yes*** to agree with the license agreement and continue the installation.



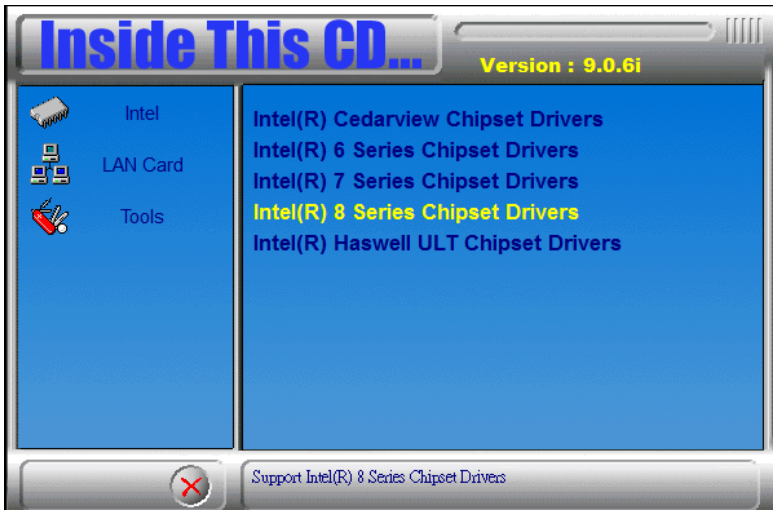
5. On the screen shown below, click ***Install*** to continue.

6. Setup complete. Click ***Finish*** to restart the computer and for changes to take effect.



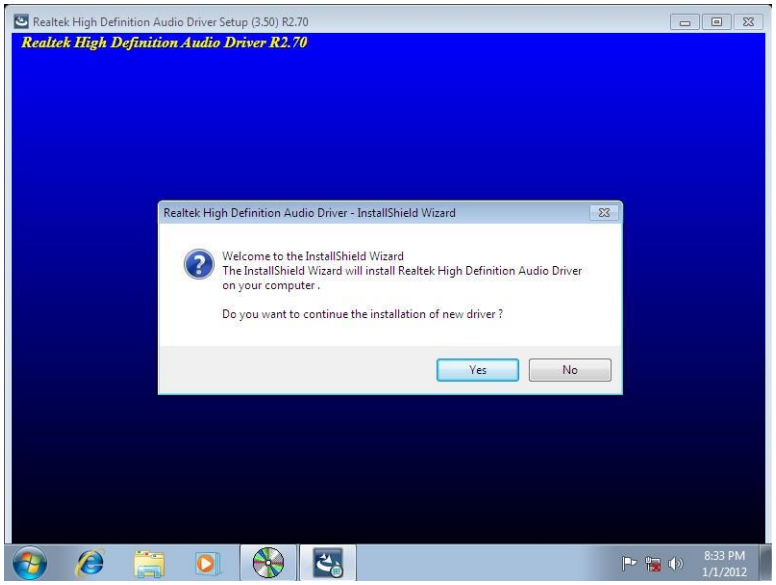
4.3 Realtek HD Audio Driver Installation

1. Insert the DVD that comes with the board. Click ***Intel*** and then ***Intel(R) 8 Series Chipset Drivers***.

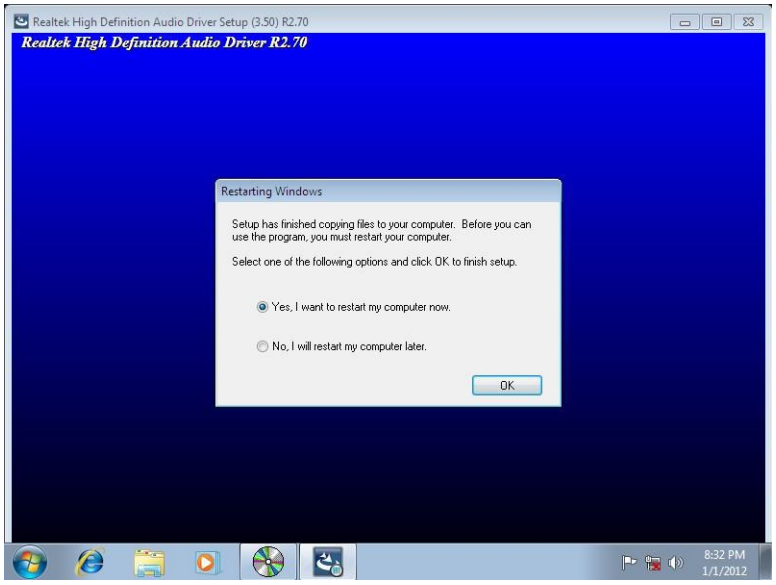


2. Click ***Realtek High Definition Audio Driver.***

3. On the Welcome to the InstallShield Wizard screen, click ***Yes*** to proceed with and complete the installation process.

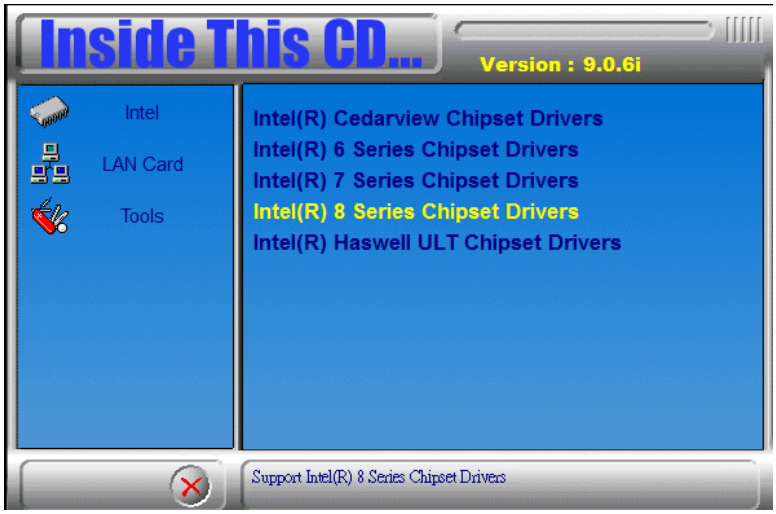


4. The InstallShield Wizard Complete. Click ***Finish*** to restart the computer and for changes to take effect.



4.4 LAN Drivers Installation

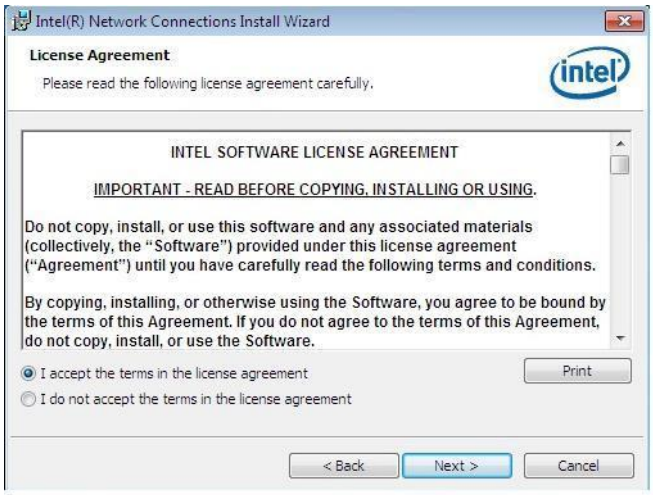
1.Insert the DVD that comes with the board. Click ***Intel*** and then ***Intel(R) 8 Series Chipset Drivers***.



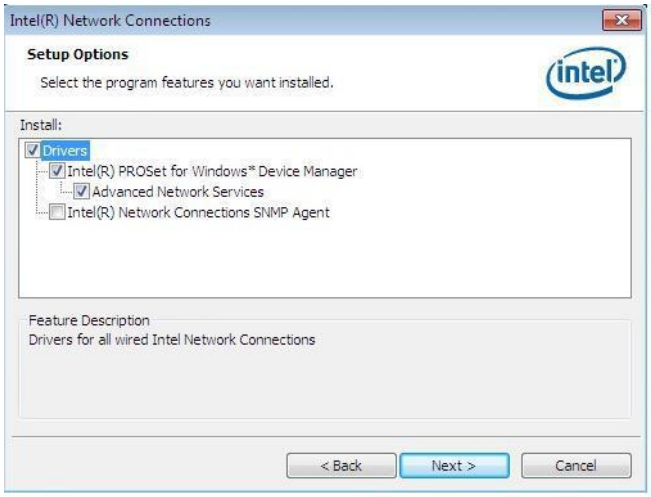
2. Click ***Intel(R) PRO LAN Network Driver.***

3. When the Welcome screen appears, click ***Next***.

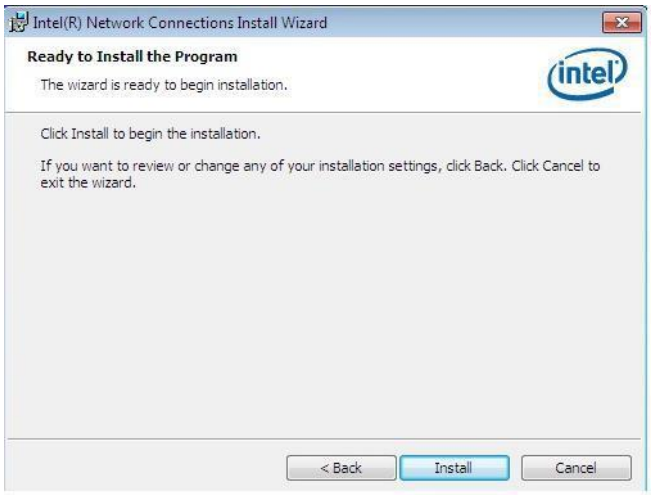
4. Click ***Next*** to to agree with the license agreement.



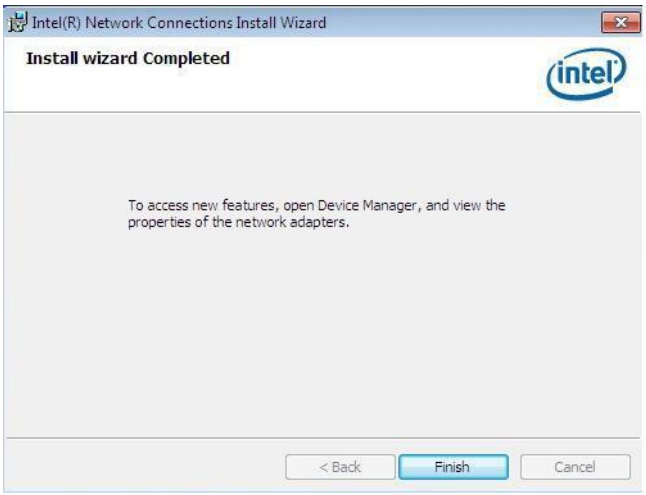
5. Click the checkbox for **Drivers** in the Setup Options screen to select it and click **Next** to continue.



6. The wizard is ready to begin installation. Click ***Install*** to begin the installation.



7. When Install Shield Wizard is complete, click ***Finish***.

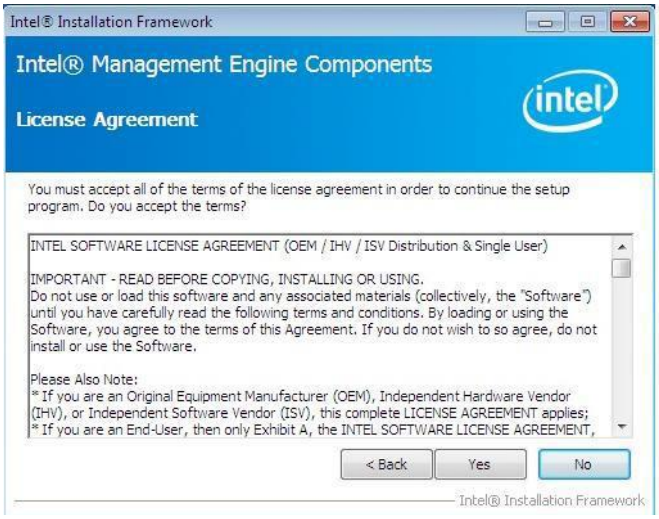


4.5 Intel Management Engine Interface

1.Insert the DVD that comes with the board. Click ***Intel*** and then ***Intel(R) 8 Series Chipset Drivers*** and then ***Intel(R) ME 9.0 Drivers***.

2. When the Welcome screen to the InstallShield Wizard for Intel® Management Engine Components, click the checkbox for **Install Intel® Control Center** & click ***Next***.

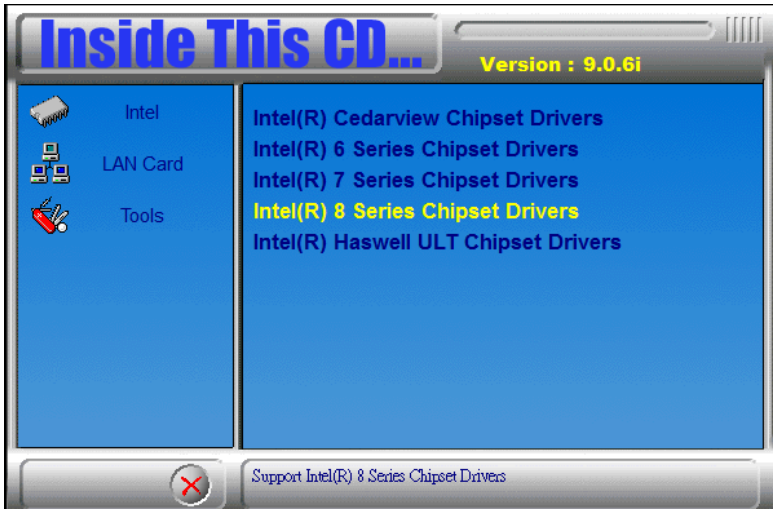
3. Click ***Yes*** to to agree with the license agreement.



4. When the Setup Progress screen appears, click ***Next***. Then, click ***Finish*** when the setup progress has been successfully installed.

4.6 USB 3.0 Drivers

1.Insert the DVD that comes with the board. Click ***Intel*** and then ***Intel(R) 8 Series Chipset Drivers***.



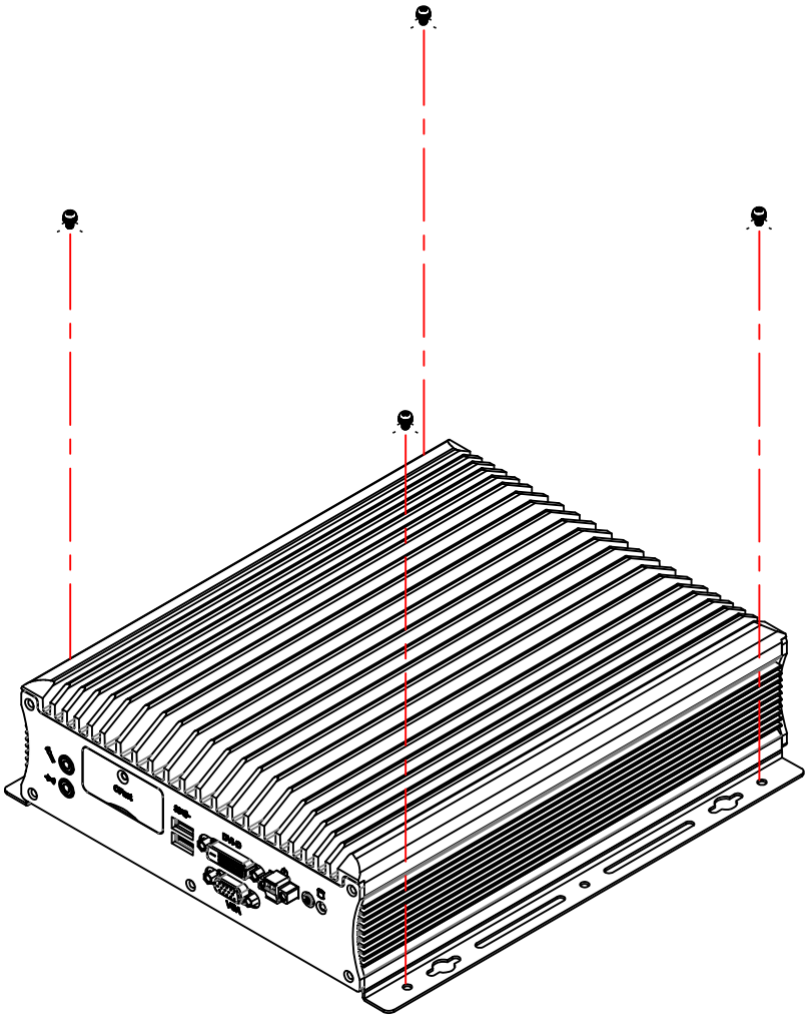
2. Click ***Intel(R) USB 3.0 Drivers.***

3. When the Welcome screen to the Install Shield Wizard for Intel® USB 3.0 extensible Host Controller Driver, click ***Next***.

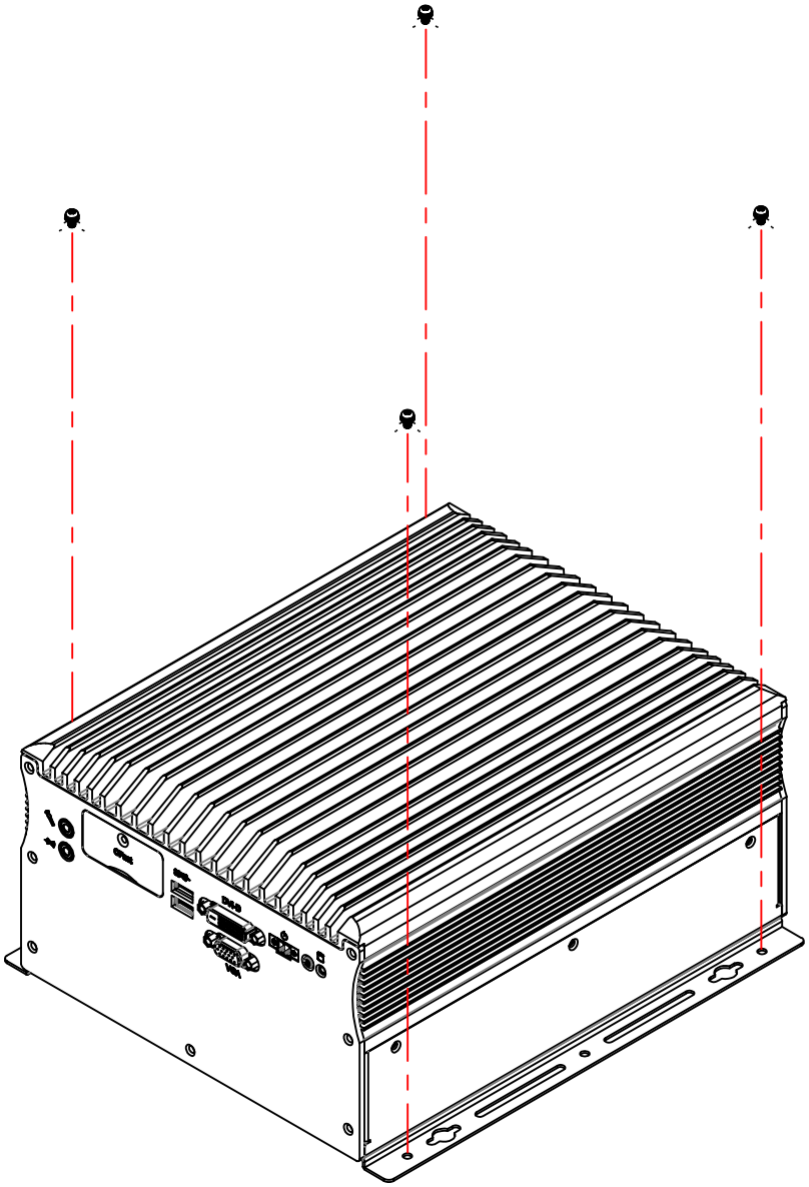
4. Click ***Yes*** to to agree with the license agreement and continue the installation.

Appendix

Mounting AMI210 to the wall



Mounting AMI210-PE to the wall



You can install AMI210 on plastic (LCD monitor), wood, drywall surface over studs, or a solid concrete or metal plane directly. Ensure the installer uses at least four M3 length 6mm screws to secure the system on wall. ***Four M3 length 6mm screws are recommended to secure the system on wall.***

Fasteners are not included with the unit, and must be supplied by the installer. The types of fasteners required are dependent on the type of wall construction. Choose fasteners that are rated either ”Medium Duty“ or ”Heavy Duty.“ To assure proper

fastener selection and installation, follow the fastener manufacturer's recommendations.

Wall Mounting Requirements

Note: *Before mounting the system on wall, ensure that you are following all applicable building and electric codes.*

When mounting, ensure that you have enough room for power and signal cable routing. And have good ventilation for power adapter. The method of mounting must be able to support weight of the CSB110-902 plus the suspend weight of all the cables to be attached to the system. Use the following methods for mounting your system:

Mounting to hollow walls

- **Method 1: Wood surface** – A minimum wood thickness – 38mm (1.5in.) by 25.4 cm (10in.) – of high, construction – grade wood is recommended.
  Note: This method provides the most reliable attachment of the unit with little risk that the unit will come loose or require ongoing maintenance.
- **Method 2: Drywall walls** - Drywall over wood studs is acceptable.

Mounting to a solid concrete or brick wall - Mounts on a flat smooth surface.

Selecting the Location

Plan the mounting location thoroughly. Locations such as walkway areas, hallways, and crowded areas are not recommended. Mount the unit to a flat, sturdy, structurally sound column or wall surface.

The best mounting surface is a standard countertop, cabinet, table, or other structure that is minimally the width and length of the unit. This recommendation reduces the risk that someone may accidentally walk into and damage the device. Local laws governing the safety of individuals might require this type of consideration.

Watchdog Timer Configuration

The WDT is used to generate a variety of output signals after a user programmable count. The WDT is suitable for use in the prevention of system lock-up, such as when software becomes trapped in a deadlock. Under these sorts of circumstances, the timer will count to zero and the selected outputs will be driven. Under normal circumstance, the user will restart the WDT at regular intervals before the timer counts to zero.

SAMPLE CODE:

```
//---------------------------------------------------------------------------
//
// THIS CODE AND INFORMATION IS PROVIDED "AS IS" WITHOUT WARRANTY OF ANY
// KIND, EITHER EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE
// IMPLIED WARRANTIES OF MERCHANTABILITY AND/OR FITNESS FOR A PARTICULAR
// PURPOSE.
//
//---------------------------------------------------------------------------
#include <dos.h>
#include <conio.h>
#include <stdio.h>
#include <stdlib.h>
#include "F81866.H"
//---------------------------------------------------------------------------
int main (int argc, char *argv[]);
void EnableWDT(int);
void DisableWDT(void);
//---------------------------------------------------------------------------
int main (int argc, char *argv[])
{
unsigned char bBuf;
unsigned char bTime;
char **endptr;
```

```
char SIO;

printf("Fintek 81866 watch dog program\n");

SIO = Init_F81866();
if (SIO == 0)
{
printf("Can not detect Fintek 81866, program abort.\n");
return(1);
}//if (SIO == 0)

if (argc != 2)
{
printf(" Parameter incorrect!!\n");
return (1);
}

bTime = strtol (argv[1], endptr, 10);
printf("System will reset after %d seconds\n", bTime);

if (bTime)
{   EnableWDT(bTime);
   }
else
{   DisableWDT();
   }

return 0;
}
//-----------------------------------------------------------------------
void EnableWDT(int interval)
{
unsigned char bBuf;

bBuf = Get_F81866_Reg(0x2B);
bBuf &= (~0x20);
Set_F81866_Reg(0x2B, bBuf);
```

```
    //Enable WDTO

Set_F81866_LD(0x07);



    //switch to logic device 7
Set_F81866_Reg(0x30, 0x01);



    //enable timer

bBuf = Get_F81866_Reg(0xF5);
bBuf &= (~0x0F);
bBuf |= 0x52;
Set_F81866_Reg(0xF5, bBuf);



    //count mode is second

Set_F81866_Reg(0xF6, interval);



    //set timer

bBuf = Get_F81866_Reg(0xFA);
bBuf |= 0x01;
Set_F81866_Reg(0xFA, bBuf);



    //enable WDTO output
```

```
bBuf = Get_F81866_Reg(0xF5);
bBuf |= 0x20;
Set_F81866_Reg(0xF5, bBuf);



   //start counting
}
//-----------------------------------------------------------------------
void DisableWDT(void)
{
unsigned char bBuf;

Set_F81866_LD(0x07);
//switch to logic device 7

bBuf = Get_F81866_Reg(0xFA);
bBuf &= ~0x01;
Set_F81866_Reg(0xFA, bBuf);



   //disable WDTO output

bBuf = Get_F81866_Reg(0xF5);
bBuf &= ~0x20;
bBuf |= 0x40;
Set_F81866_Reg(0xF5, bBuf);



   //disable WDT
}
//-----------------------------------------------------------------------
```

```
//---------------------------------------------------------------------------
//
// THIS CODE AND INFORMATION IS PROVIDED "AS IS" WITHOUT
WARRANTY OF ANY
// KIND, EITHER EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED
TO THE
// IMPLIED WARRANTIES OF MERCHANTABILITY AND/OR FITNESS FOR
A PARTICULAR
// PURPOSE.
//
//---------------------------------------------------------------------------
#include "F81866.H"
#include <dos.h>
//---------------------------------------------------------------------------
unsigned int F81866_BASE;
void Unlock_F81866 (void);
void Lock_F81866 (void);
//---------------------------------------------------------------------------
unsigned int Init_F81866(void)
{
unsigned int result;
unsigned char ucDid;

F81866_BASE = 0x4E;
result = F81866_BASE;

ucDid = Get_F81866_Reg(0x20);
if (ucDid == 0x07)




   //Fintek 81866
{   goto Init_Finish;
   }

F81866_BASE = 0x2E;
result = F81866_BASE;
```

```
ucDid = Get_F81866_Reg(0x20);
if (ucDid == 0x07)




   //Fintek 81866
{   goto Init_Finish;
   }

F81866_BASE = 0x00;
result = F81866_BASE;

Init_Finish:
return (result);
}
//-----------------------------------------------------------------------------
void Unlock_F81866 (void)
{
outportb(F81866_INDEX_PORT, F81866_UNLOCK);
outportb(F81866_INDEX_PORT, F81866_UNLOCK);
}
//-----------------------------------------------------------------------------
void Lock_F81866 (void)
{
outportb(F81866_INDEX_PORT, F81866_LOCK);
}
//-----------------------------------------------------------------------------
void Set_F81866_LD( unsigned char LD)
{
Unlock_F81866();
outportb(F81866_INDEX_PORT, F81866_REG_LD);
outportb(F81866_DATA_PORT, LD);
Lock_F81866();
}
//-----------------------------------------------------------------------------
void Set_F81866_Reg( unsigned char REG, unsigned char DATA)
```

```
{
Unlock_F81866();
outportb(F81866_INDEX_PORT, REG);
outportb(F81866_DATA_PORT, DATA);
Lock_F81866();
}
//----------------------------------------------------------------------

unsigned char Get_F81866_Reg(unsigned char REG)
{
unsigned char Result;
Unlock_F81866();
outportb(F81866_INDEX_PORT, REG);
Result = inportb(F81866_DATA_PORT);
Lock_F81866();
return Result;
}
//----------------------------------------------------------------------
//----------------------------------------------------------------------
//
// THIS CODE AND INFORMATION IS PROVIDED "AS IS" WITHOUT
WARRANTY OF ANY
// KIND, EITHER EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED
TO THE
// IMPLIED WARRANTIES OF MERCHANTABILITY AND/OR FITNESS FOR
A PARTICULAR
// PURPOSE.
//
//----------------------------------------------------------------------
#ifndef __F81866_H
#define __F81866_H


   1
//----------------------------------------------------------------------
#define    F81866_INDEX_PORT

   (F81866_BASE)
```

```
#define    F81866_DATA_PORT

   (F81866_BASE+1)
//-----------------------------------------------------------------------------
#define    F81866_REG_LD


   0x07
//-----------------------------------------------------------------------------
#define F81866_UNLOCK

   0x87
#define    F81866_LOCK



   0xAA
//-----------------------------------------------------------------------------
unsigned int Init_F81866(void);
void Set_F81866_LD( unsigned char);
void Set_F81866_Reg( unsigned char, unsigned char);
unsigned char Get_F81866_Reg( unsigned char);
//-----------------------------------------------------------------------------
#endif    //__F81866_H
```