IB32 Motherboard

3.5” SBC with Intel ® Bay Trail Processors, HDMI, LVDS, VGA, Dual Giga Ethernet, and Mini-PCIe Interface

V200

User Manual

Version 1.7

Manual Number: 9171111I101Y

Preface

This product can be used only in industrial-grade computers.

Copyright Notice

Trademark Acknowledgement

Disclaimer

We reserve the right to make changes, without notice, to any product, including circuits and/or software described or contained in this manual in order to improve design and/or performance. We assume no responsibility or liability for the use of the described product(s), conveys no license or title under any patent, copyright, or masks work rights to these products, and makes no representations or warranties that these products are free from patent, copyright, or mask work right infringement, unless otherwise specified. Applications that are described in this manual are for illustration purposes only. We make no representation or warranty that such application will be suitable for the specified use without further testing or modification.

Warranty

We warrant that each of its products will be free from material and workmanship defects for a period of one year from the invoice date. (Standard is one year, extended warranty will need to discuss with our sales representatives. If the customer discovers a defect, we will, at its option, repair or replace the defective product at no charge to the customer, provided it is returned during the warranty period of one year, with transportation charges prepaid. The returned product must be properly packaged in its original packaging to obtain warranty service.

If the serial number and the product shipping data differ by over 30 days, the in-warranty service will be made according to the shipping date. In the serial numbers the third and fourth two digits give the year of manufacture, and the fifth digit means the month (e. g., with A for October, B for November and C for December).

For example, the serial number 1W16Axxxxxxxx means October of year 2016.

Packing List

Before using this Motherboard, please make sure that all the items listed below are present in your package:

- IB32 Motherboard
- User Manual & Driver CD

Optional Accessories:

- AC to DC 12V Power Adapter
- Power Cord

If any of these items are missing or damaged, contact your distributor or sales representative immediately.

Customer Service

We provide a service guide as below for any problem by the following steps: First, contact your distributor, sales representative, or our customer service center for technical support if you need additional assistance. You need to prepare the following information before you call:

- Product serial number
- Peripheral attachments
- Software (OS, version, application software, etc.)
- Detailed problem description
- The exact wording of any error messages

In addition, free technical support is available from our engineers every business day. We are always ready to give advice on application requirements or specific information on the installation and operation of any of our products. Please do not hesitate to call or e-mail us.

Advisory Conventions

Three types of advisories are used throughout the user manual to provide helpful information or to alert you to the potential for hardware damage or personal injury. These are Notes, Important, Cautions, and Warnings. The following is an example of each type of advisory.

NOTE:
A note is used to emphasize helpful information

IMPORTANT:
An important note indicates information that is important for you to know.

CAUTION
A Caution alert indicates potential damage to hardware and explains how to avoid the potential problem.

WARNING!
An Electrical Shock Warning indicates the potential harm from electrical hazards and how to avoid the potential problem.

Safety Precautions

WARNING!

Always completely disconnect the power cord from your chassis whenever you work with the hardware. Do not make connections while the power is on. Sensitive electronic components can be damaged by sudden power surges. Only experienced electronic personnel should open the PC chassis.

CAUTION

Always ground yourself to remove any static charge before touching the CPU card. Modern electronic devices are very sensitive to static electric charges. As a safety precaution, use a grounding wrist strap at all times. Place all electronic components in a static-dissipative surface or static-shielded bag when they are not in the chassis.

Safety and Warranty

1. Please read these safety instructions carefully.
2. Please keep this user- manual for later reference.
3. Please disconnect this equipment from any AC outlet before cleaning. Do not use liquid or spray detergents for cleaning. Use a damp cloth.
4. For pluggable equipment, the power outlet must be installed near the equipment and must be easily accessible.
5. Keep this equipment away from humidity.
6. Put this equipment on a reliable surface during installation. Dropping it or letting it fall could cause damage.
7. Make sure the voltage of the power source is correct before connecting the equipment to the power outlet.
8. Position the power cord so that people cannot step on it. Do not place anything over the power cord.
9. All cautions and warnings on the equipment should be noted.
10. If the equipment is not used for a long time, disconnect it from the power source to avoid damage by transient over-voltage.
11. If any of the following situations arises, get the equipment checked by service personnel:
    A. The power cord or plug is damaged.
    B. Liquid has penetrated into the equipment.
    C. The equipment has been exposed to moisture.
    D. The equipment does not work well, or you cannot get it to work according to the user's manual.
    E. The equipment has been dropped and damaged.
    F. The equipment has obvious signs of breakage.

Revision History

Manual Version	Board Version	Released Date	Note
1.0	V100	6-Mar-2014	Initial Draft
1.1	V100	15-Aug-2014	Add Recovery Guide
1.2	V100	1-Oct-2014	Add OS Selection
1.3	V110	8-May-2015	Add USB 3.0 Driver Installation
1.4	V110	26-Oct-2015	Adjust format
1.5	V110	15-Dec-2015	- Correct CPU Frequency (1.83MHz); - Correct PIN Assignment: JP10, CON1, CON3, DCJACK2, Panel1, SIM1, SSD1, VGA1, DCJACK1, HDMI; -Adjust format
1.6	V110	7-Jul-2016	Added Appendix A “Watchdog Utility Reference”
1.7	V200	9-Sep-2017	Change LAN Chip to Intel® I210 GbE

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General Information

This chapter includes the IB32 Motherboard background information.

Sections include:

1.1 Introduction
1.2 Features
1.3 Motherboard Specifications

1.1 Introduction

Thank you for choosing the IB 32 motherboard. This motherboard is integrated with Intel® Celeron® Bay Trail-M N2930 1.83GHz which offers a high performance computing platform with low power consumption. The new motherboard supports 204-pin SO-DIMM DDR3L at speeds of 1333/1600 MHz, up to 8GB.

There is an advanced full set of I/O ports including one USB 3.0, five USB 2.0, two LAN ports and audio jack for microphone, line-in and line-out. The motherboard is designed in 3.5” form factor and measures 146mm x 102mm.

1.2 Features

- 3.5” Form Factor (146mm x 102mm / 5.7 x 4 inches)
- Supports Intel® Celeron® Bay Trail-M N2930
- System memory up to 8GB DDR3L 1333/1600, SO-DIMM
- Intel® HD Graphics 4400 Integrated Graphics Engine
- 2 x Giga LAN (Intel® Intel® I210 GbE)
- 2 x Mini PCIe, 4 x COM, 1 x USB3.0, 5 x USB 2.0 ,1 x SATAII, 1 x 12 bit GPIO port, 1 x HDMI,1xVGA

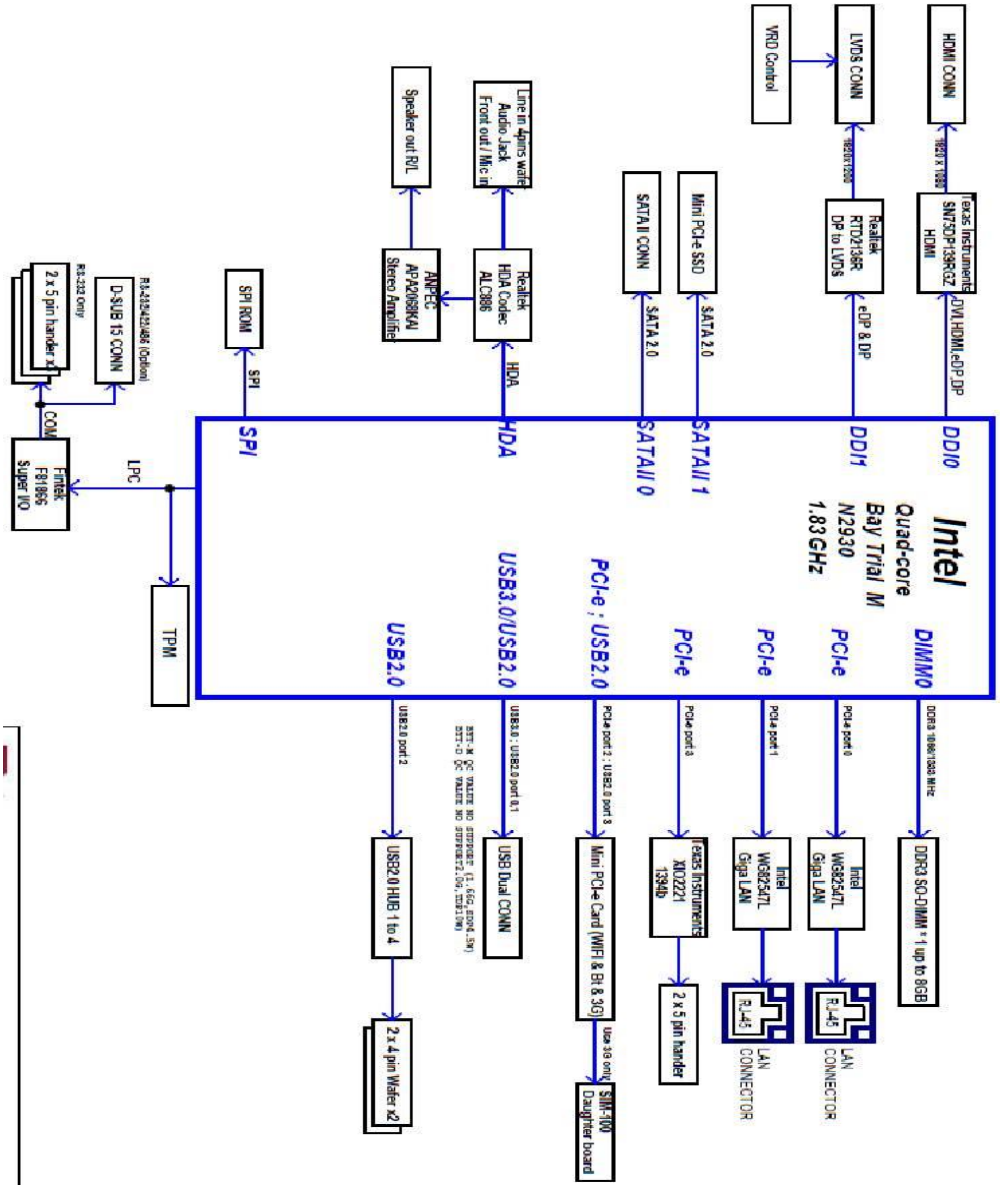
1.3 Motherboard Specifications

1.3.1 Hardware and Software Description

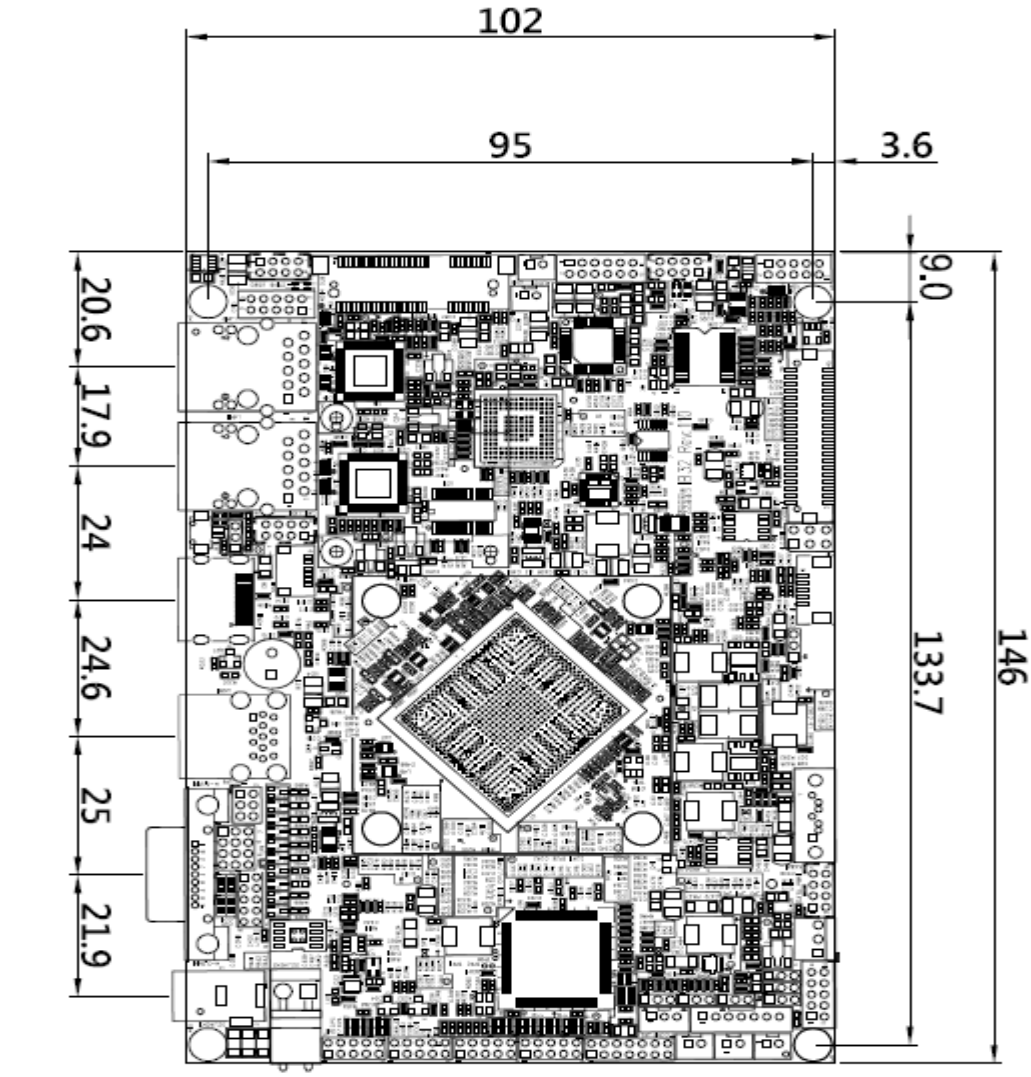
Hardware:		
System Specifications	Processor	Intel® Celeron® Bay Trail-M N2930 1.83GHz (2M Cache, up to 2.00 GHz)
	System Memory	DDR3L 1066 MHz SO-DIMM Slot, Max. 8GB
	Chipset	Intel ATOM SoC Integrated
	Super IO Chipset	Fintek F81866
	BIOS	AMI 64Mbit Flash
Display Specification	Graphic	Intel® HD Graphics Engine
	LCD Interface	Dual-channel18/24bit LVDS Up to1920x1080@ 60Hz
	Graphic Resolution	VGA Mode: Up to 1600 x 1200 @ 60Hz HDMI : 1920 x 1080 @ 60Hz
Audio	Codec	Realtek ALC886 HD Audio Codec
	Audio Interface	Line-in, Line-out, Mic in
Ethernet	LAN	2 x Giga LAN (Intel® I210 GbE)
	Ethernet Interface	1000 Base-Tx Gigabit Ethernet Compatible
I/O Connectons	Rear I/O	2 x RJ-45 1 x HDMI 1 x USB 3.0, 1 x USB 2.0 1 x RS232 / 422 / 485 1 x DC-in Power Jack (+12V)
	Internal I/O	3 x RS-232 / 10-pin(2x5) 4 x USB 2.0 / 8-pin(2x4) 1 x LVDS / 40-pin(2x20) DF-13 connector 1 x SATA II 1 x SATA Power 1 x Digital I/O(12-bit GPIO) / 14-pin(2x7) 1 x Power-input / 2-pin 1 x +12V for external power(Yellow) / 2-pin 1 x +5V for external power(Red) / 2-pin 1 x +3.3V for external power(Blue) / 2-pin 1 x Fan / 3-pin 1 x Panel inverter / 7-pin 1 x Front panel / 10-pin(2x5) 1 x Backlight brightness controller / 3-pin 2 x Speaker with Amp. / 2-pin 1 x VGA / 10-pin(2x5) 1 x 1394b / 10-pin(2x5) 1 x Audio (Mic-in / Line-in / Line-out) / 12-pin(2x6) 1 x Battery / 2-pin
	Expansion Slot	1 x Mini PCIe slot (for USB 2.0 wireless module) 1 x Mini PCIe slot (for SATA II SSD)
Mechanical Specifications	Dimensions (L x W)	146mm x 102mm
	Form Factor	3.5 inch
Environmental Considerations	Operating Temp.	-20 deg.C to 60 deg.C
	Storage Temp.	-40 deg.C to 70 deg.C
	Humidity	10~95% RH@400C, non-condensing
Power Management	Power Requirement	12V DC-IN Power Jack

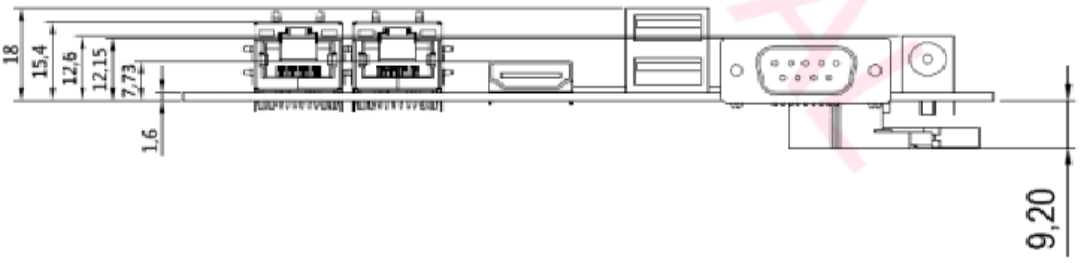
Software Support:	
Drivers	Intel Chipset Driver Graphics Driver Audio Driver Intel Sideband Fabric Device (Intel MBI) Driver (Windows 8) Intel Trusted Engine Interface (Intel TXE) Driver USB 3.0 Driver (Windows 7)
SDK	Digital I/O Watchdog

1.3.2 Function block (V200)



1.3.3 Board dimensions (V200)





AC to DC Power Adapter Components (optional)

AC to DC 12V Power Adapter

Power Cord

The Motherboard allows plugging in 12V DC-IN jack on the board without another power module converter under Intel® Bay Trail-M Celeron N2930 processor power consumption.

Hardware Installation

This chapter provides information on how to use jumpers and connectors on the IB32 Motherboard. Be cautious while working with these modules. Please carefully read the content of this chapter in order to avoid any damages.

The sections include:

2.1 Memory Module Installation
2.2 I / O Equipment Installation
2.3 Jumpers and Connectors
2.4 Jumper Settings
2.5 Connectors and Pin Assignment

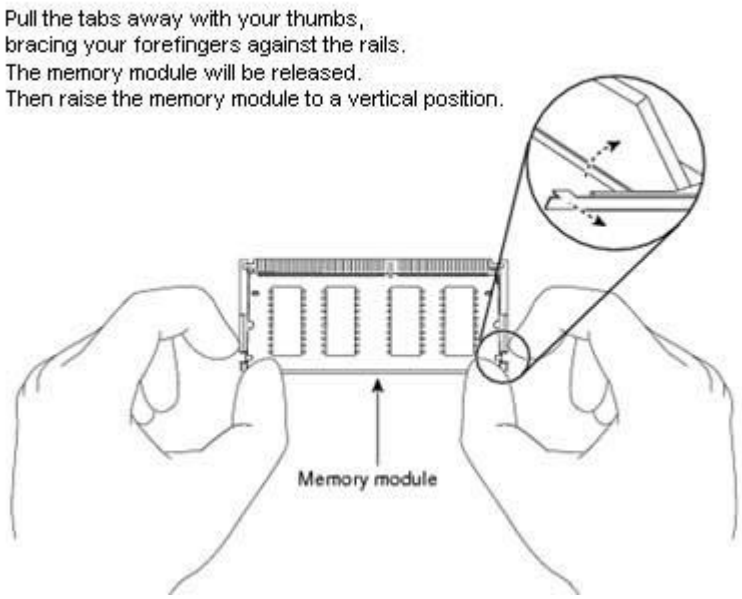
Chapter 2 Hardware Installation

2.1 Memory Module (SO-DIMM) Installation

The IB32 Motherboard has two 204-pin SODIMM slot. The socket supports up to 8GB DDR3L 1333/1600 SDRAM. When installing the –memory unit, please follow the steps below:

Steps 1 Firmly insert the SO-DIMM at an angle of about 30-degree into the slot. Align the SO-DIMM with the slot until it is fully inserted. The notch on the SO-DIMM should match the break on the slot.

Step 2 Press downwards on SO-DIMM until the retaining clips at both ends fully snap closed and the SO-DIMM is properly seated.



CAUTION

The SO-DIMM only fits in one correct orientation. It will cause permanent damage to the development board and the SO-DIMM if the SO-DIMM is forced into the slot at the incorrect orientation.

I/O Equipment Installation

2.2.1 12V DC-IN

The Motherboard allows plugging in 12V DC-IN jack on the board without another power module converter under power consumption by Intel® Celeron® Bay Trail-M N2930 1.83GHz

2.2.2 Serial COM ports

Three RS-232 connectors build-in the rear I/O. One optional COM port supports RS-422/485. When an optional touch-screen is ordered with PPC, serial COM port can be connected to a serial or an optional touch-screen.

2.2.3 External HDMI

The Motherboard has one HDMI port that can be connected to an external LCD monitor by HDMI cable, and it also needs to be connected to the outlet by power cable. The HDMI connector is a standard 19-pin Type A connector.

2.2.4 Ethernet interface

The Motherboard is equipped with Intel® 82574L Gigabit-LAN Controller + I218LM Gigabit-LAN PHY which is fully compliant with the PCI 10/100/1000 Mbps Ethernet protocol compatible. It is supported by major network operating systems. The Ethernet ports provide two standard RJ-45 jacks.

2.2.5 USB ports

Six USB devices (four with pin headers) can be connected to the system through an adapter cable. You should install the device driver before you use the device. Various adapters may come with USB ports. USB usually connected the external system. The USB ports support hot plug-in connection.

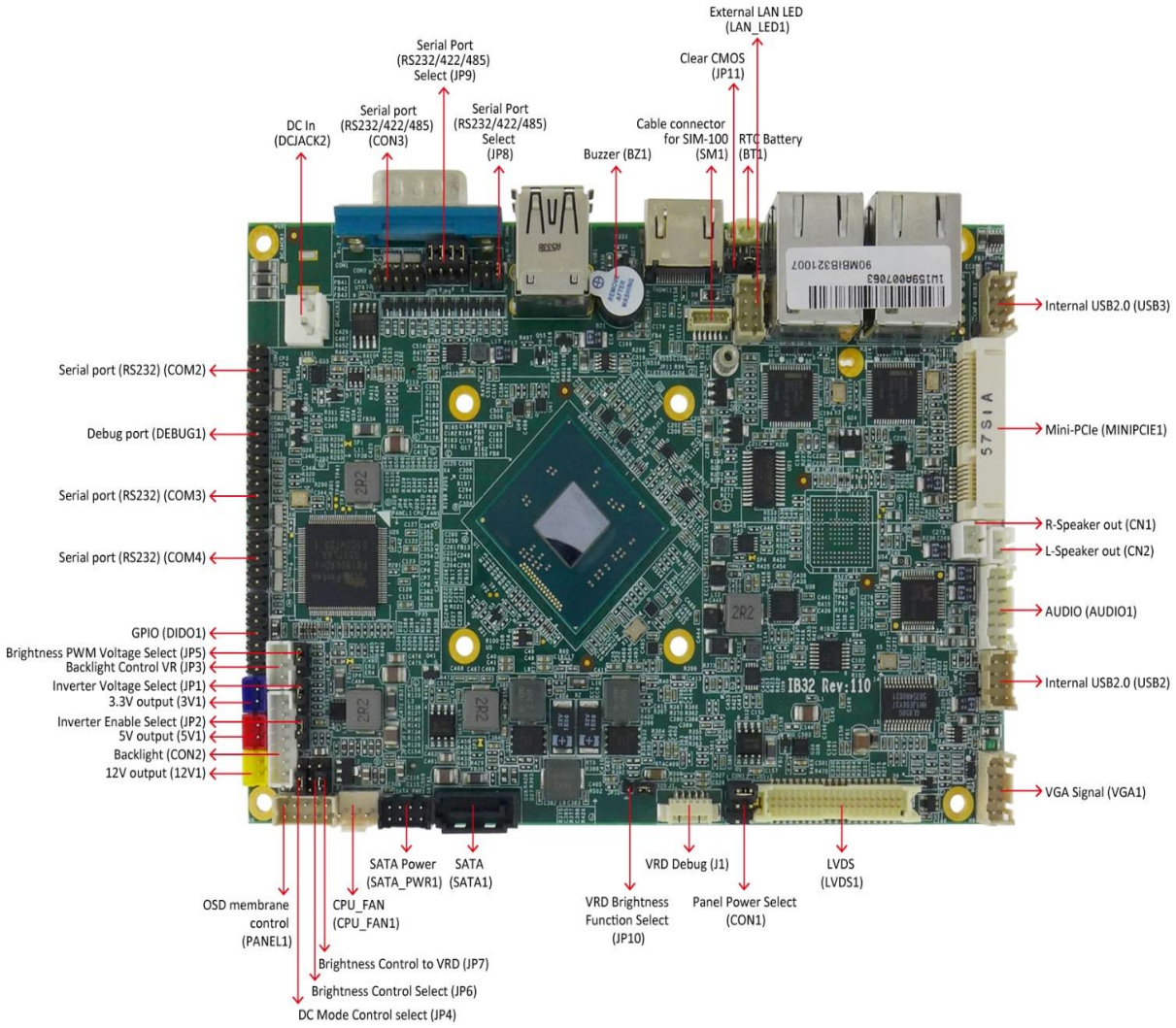
2.2.6 Audio function

The Audio 7.1 channel capabilities are provided by a Realtek ALC886 chipset supporting digital audio outputs. The audio interface includes three jacks: line-in, line-out and mic-in.

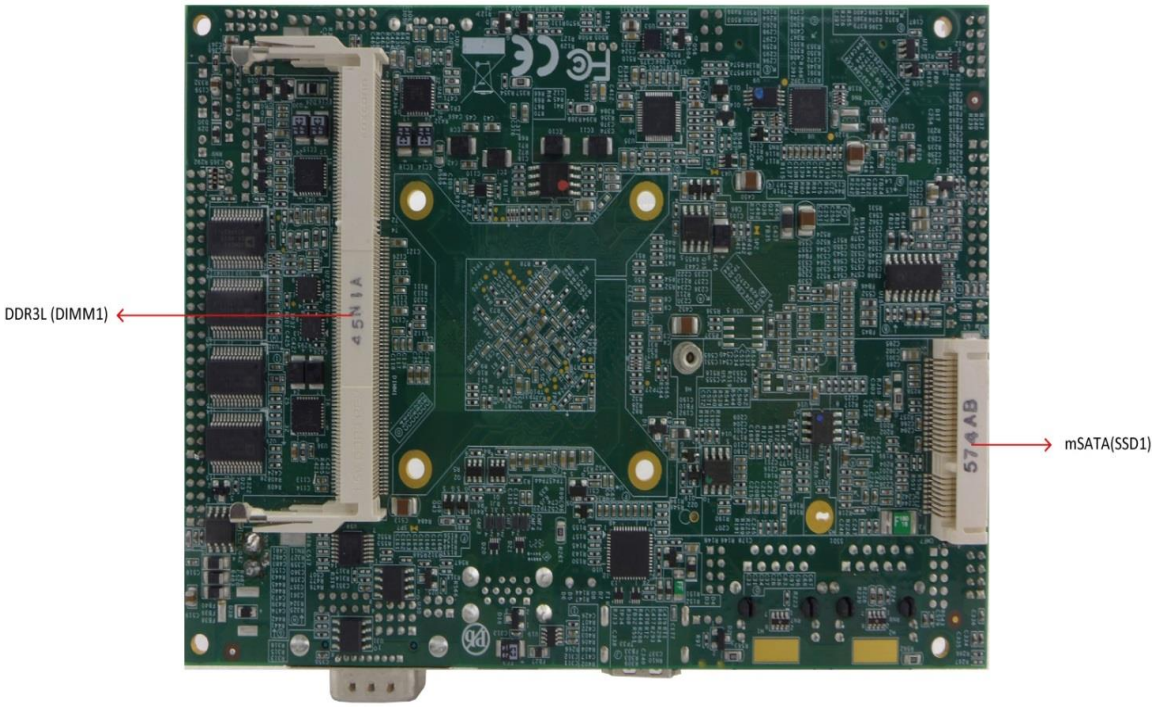
2.2 Jumpers and Connectors

This section describes the location of each of the board's jumpers and connectors.

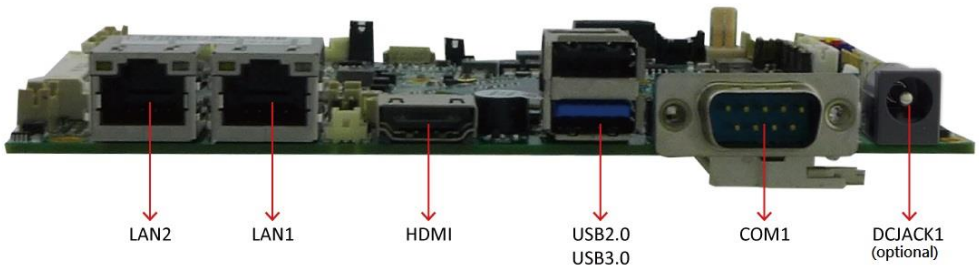
2.3.1 Component Side



2.3.2 Solder Side



2.3.3 I/O Side

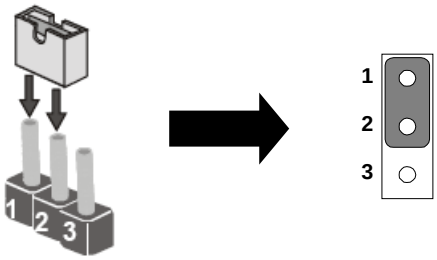


2.3 Jumper Settings

This section explains how to set jumpers for correct configuration of the motherboard.

NOTE:
A pair of needle nose pliers may be helpful when working with jumpers. If you have any doubts about the best hardware configuration for your application, contact your local distributor or sales representative before you make any changes. Generally, you simply need a standard cable to make most connections.

The jumper setting diagram is shown below. When the jumper cap is placed on both pins, the jumper is SHORT. The illustration below shows a 3-pin jumper; pins 1 and 2 are short. If you remove the jumper cap, the jumper is OPEN.



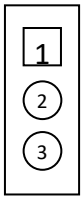
2.4.1 Jumper List

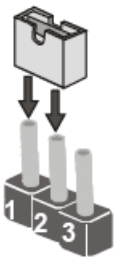
The following table shows the function of each of the board's jumpers.

Label	Function	Note
JP1	Backlight Power selector	1x3 header, pitch 2.0mm
JP2	Backlight Power Enable Selector	1x3 header, pitch 2.0mm
JP3	Backlight Control VR	1x3 Wafer, pitch 2.0mm
JP4	DC Mode Control selector	1x3 header, pitch 2.0mm
JP5	Backlight Control Power selector	1x3 header, pitch 2.0mm
JP6	Brightness Control Mode Selector	1x3 header, pitch 2.0mm
JP7	Brightness Control To VRD Selector	1x3 header, pitch 2.0mm
JP8	Serial Port(RS232/422/485)Select	2x3 header, pitch 2.0mm
JP9	Serial Port(RS232/422/485)Select	3x4 header, pitch 2.0mm
JP10	VRD Brightness Control Select	1x3 header, pitch 2.0mm
JP11	Clear CMOS	1x3 header, pitch 2.0mm

2.4.2 Setting Jumpers

2.4.2.1 JP1: Backlight Power Selector

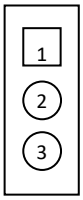


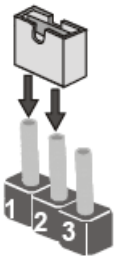


Setting	Function
1-2*	5 V
2-3	12 V

*Default

2.4.2.2 JP2: Backlight Enable Selector

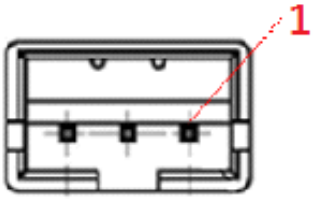




Setting	Function
1-2*	Control by platform
2-3	Always on

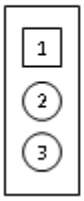
*Default

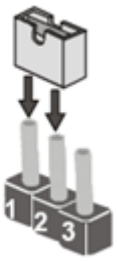
2.4.2.3 JP3: Backlight Control VR



Pin №	Name	Pin №	Name
1	+5V	2	Black Light Control
3	GND		

2.4.2.4 JP4: DC Mode Control Selector

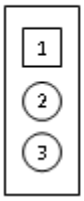


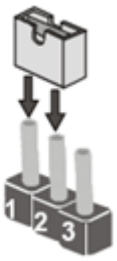


Setting	Function
1-2	VR knob Control to VRD
2-3*	VR knob Control to SBC

*Default

2.4.2.5 JP5: Backlight Control Power Selector

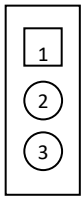


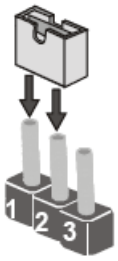


*Default

Setting	Function
1-2	+ 3.3V
2-3*	+ 5.0V

2.4.2.6 JP6: Brightness Control Selector

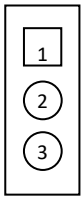


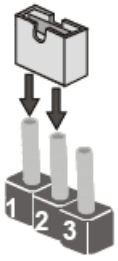


*Default

Setting	Function
1-2	Adjust by VR Knob
2-3*	PWM Mode

2.4.2.7 JP7: Brightness Control to VRD Selector





*Default

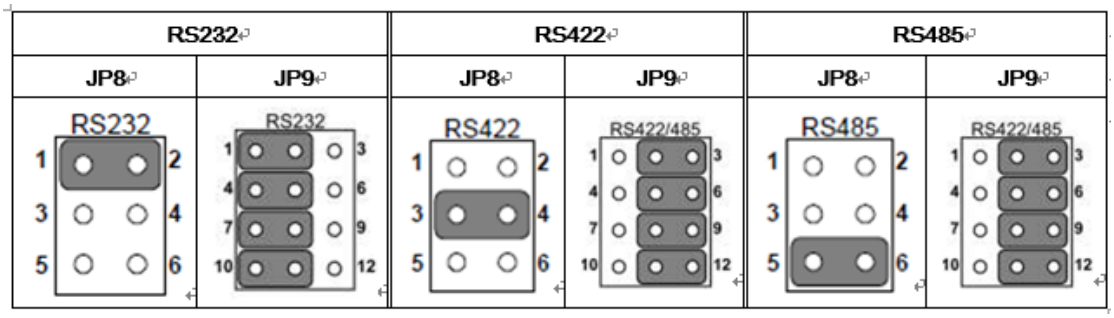
Setting	Function
1-2	WM to DC mode by software
2-3*	VRD Control Mode

2.4.2.8 JP8/JP9: Serial Port (RS232/422/485) Select

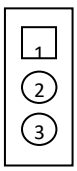
Refer to J8/J9 settings below.

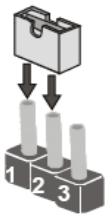
	RS232	RS422	RS485
JP8	1-2	3-4	5-6
JP9	1-2	2-3	2-3
	4-5	5-6	5-6
	7-8	8-9	8-9
	10-11	11-12	11-12

For example: At the picture below you can see RS-232, RS-422, RS-485 (J8/J9) jumper setting. To Select RS-232 set Jumper 8 Pin 1-2 to the SHORT position, and Jumper 9 Pin1-2, 4-5, 7-8, 10-11 to the SHORT position.



2.4.2.9 JP10: VRD Brightness Control Select

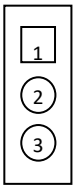


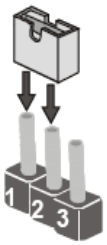


*Default

Setting	Function
1-2	VRD REVERSE -
2-3*	VRD FORWARD +

2.4.2.10 JP11: Clear CMOS





*Default

Setting	Function
1-2	Clear CMOS
2-3*	Normal

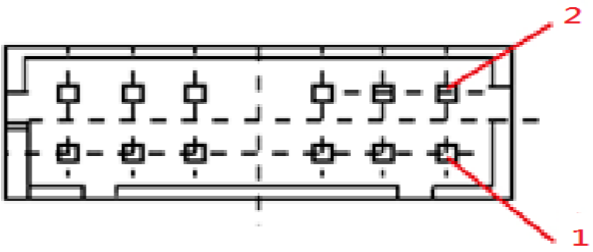
2.5 Connectors and Pin Assignment

2.5.1 Front Side Setting Description

Label	Function	Note
AUDIO1	AUDIO	2x6 Wafer, pitch 2.0mm
BT1	RTC Battery	2P Wafer, pitch 1.25mm
CN1	R-Speaker out	1x2 Wafer, pitch 2.0mm
CN2	L-Speaker out	1x2 Wafer, pitch 2.0mm
CON1	Panel Power Selector	2x3 header, pitch 2.54mm
CON2	Backlight	1x7 Wafer, pitch 2.0mm
CON3	Serial port (RS232/422/485)	2x5 header, pitch 2.0mm
COM2	Serial port (RS232)	2x5 header, pitch 2.0mm
COM3	Serial port (RS232)	2x5 header, pitch 2.0mm
COM4	Serial port (RS232)	2x5 header, pitch 2.0mm
CPU_FAN1	CPU_FAN	3P Wafer, pitch 2.54mm
DCJACK2	DC In 2.5	1x2P Wafer, pitch 3.96mm
DEBUG1	DEBUG PORT	2x5 header, pitch 2.0mm
DIMM1	DDR3L	204pin,SODIMM slot
DIDO1	GPIO	2x7 header, pitch 2.0mm
J1	VRD Debug	1x5 Wafer, pitch 1.25mm
LAN_LED1	External LAN LED	2x4 Wafer, pitch 2.0mm
LVDS1	LVDS	2x20 Wafer, pitch 1.25mm
MINI PCIE1	Mini-PCIE	Mini-PCIe slot
Panel1	OSD membrane control	2x5 Wafer, pitch 2.0mm
SATA1	SATA	SATA Connector
SATA_PWR1	SATA Power	2x4 Wafer, pitch 2.0mm
SIM1	Cable connector for SIM-100	6P Wafer, pitch 1.0mm
SSD1	mSATA	Mini-PCIe slot
USB2	Internal USB2.0	2x4 Wafer, pitch 2.0mm
USB3	Internal USB2.0	2x4 Wafer, pitch 2.0mm

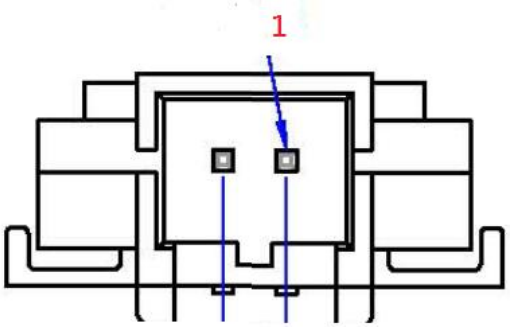
VGA1	VGA Signal	2x5 Wafer, pitch 2.0mm
3V1	3.3V output	1x2 Wafer, pitch 2.0mm
5V1	5V output	1x2 Wafer, pitch 2.0mm
12V1	12V output	1x2 Wafer, pitch 2.0mm

AUDIO1: AUDIO



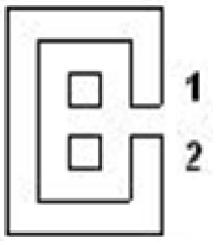
Pin №	Name	Pin №	Name
1	LINE_OUT_R	2	LINE_OUT_L
3	+5V	4	GND
5	LINE_IN_R	6	LINE_IN_L
7	MIC_R	8	MIC_L
9	GND	10	LINE_OUT_JACK DET
11	MIC_JACK DET	12	LINE_IN_JACK DET

BT1: COMS Battery



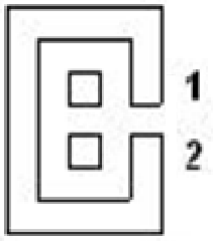
Pin №	Name	Pin №	Name
1	BAT	2	GND

CN1: R-Speaker Out



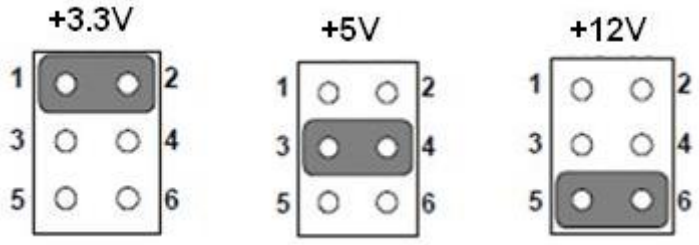
Pin №	Name
1	ROUT-
2	ROUT+

CN2: L-Speaker Out



Pin №	Name
1	LOUT-
2	LOUT+

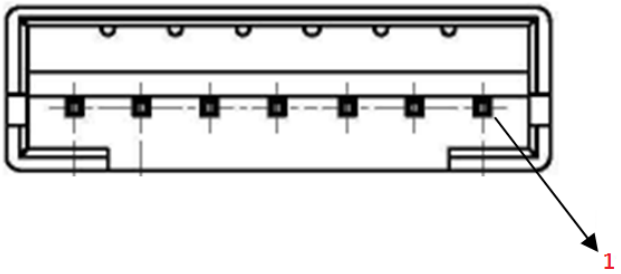
CON1: Panel Power Select



Setting	Function
1-2*	Panel Power +3.3V
3-4	Panel Power +5V
5-6	Panel Power +12V

*Default

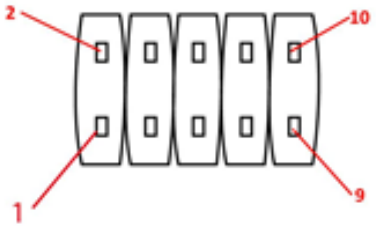
CON2: Backlight



Pin №	Name	Pin №	Name
1	Backlight Power	2	Backlight Power
3	Backlight Power	4	GND
5	Brightness Adjust	6	GND
7	Backlight Enable		

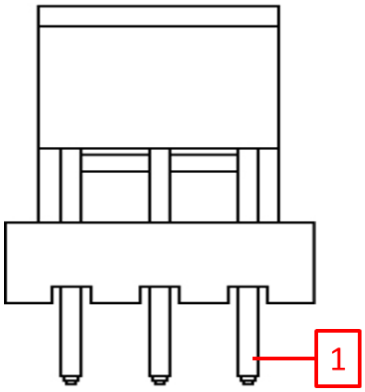
Note: Please refer to JP1 settings to select POWER RATING

CON3: Serial ports (RS232/422/485)



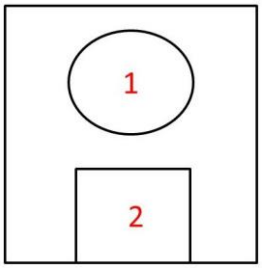
Pin №	Name	Pin №	Name
1	DCD	2	DSR
3	RXD	4	RTS
5	TXD	6	CTS
7	DTR	8	RI
9	GND	10	GND

CPU_FAN1: CPU FAN



Pin №	Name	Pin №	Name
1	GND	2	+12V
3	SENSE		

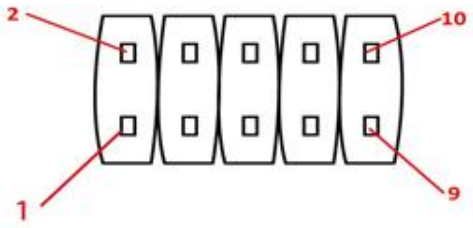
DCJACK2: DC-In 2.5



Pin №	Name	Pin №	Name
1	DC_IN	2	GND
3*	GND		

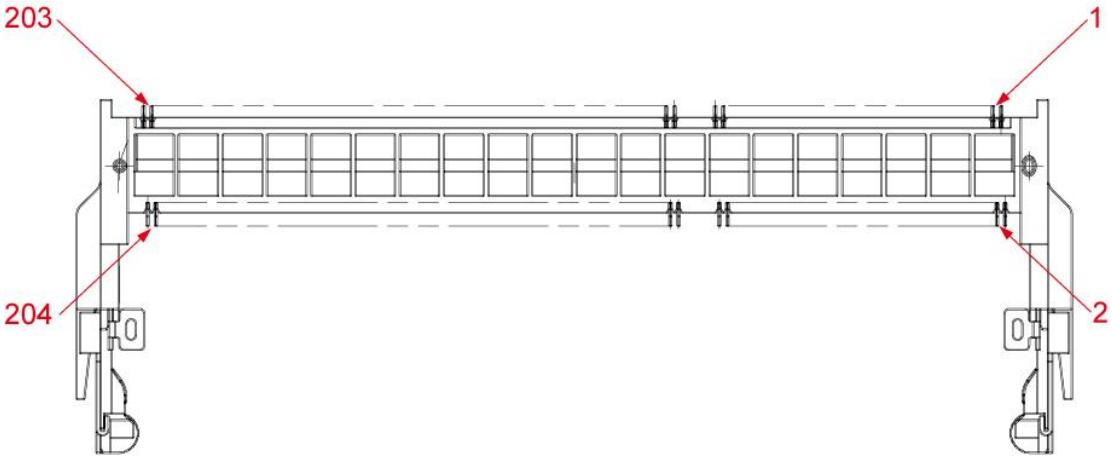
*Not visible for user

Debug 1: Debug Port

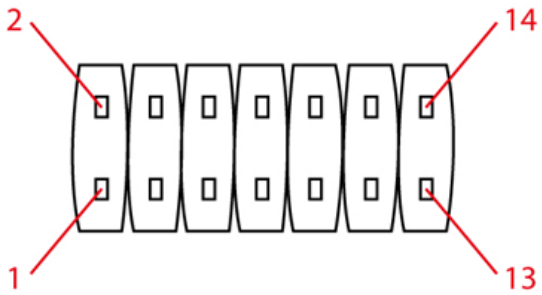


Pin №	Name	Pin №	Name
1	LPC_AD0	2	+3.3V
3	LPC_AD1	4	GND
5	LPC_AD2	6	LPC_FRAME
7	LPC_AD3	8	GND
9	RESET	10	CLOCK

DIMM1: DDR3 SODIMM

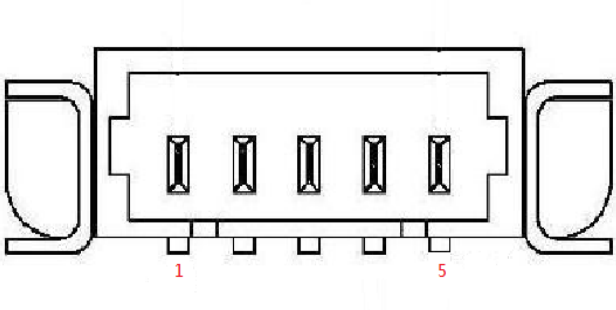


DIDO1: GPIO



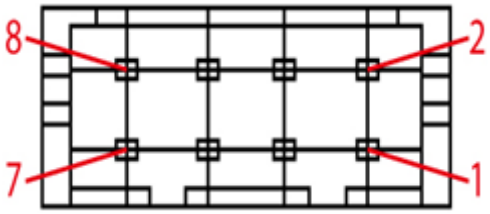
Pin №	Name	Pin №	Name
1	GND	2	+5V
3	DOUT3	4	DOUT1
5	DOUT2	6	DOUT0
7	DINT3	8	DINT1
9	DINT2	10	DINT0
11	DIN4	12	DOUT4
13	DIN5	14	DOUT5

J1: VRD Debug



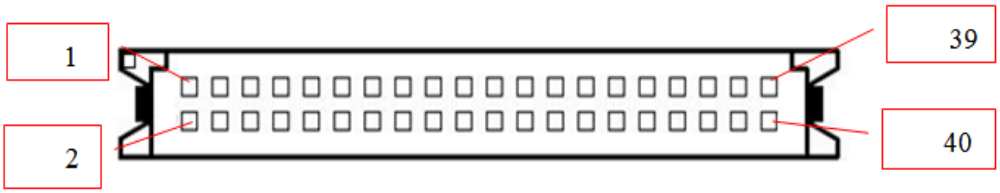
Pin №	Name	Pin №	Name
1	+3.3V	2	DATA
3	CLOCK	4	RESET
5	GND		

LAN_LED1: External LAN LED



Pin №	Name	Pin №	Name
1	+3.3V	2	LAN1_1000_O
3	LAN1_100_10_G	4	LAN1_ACTIVE_Y
5	+3.3V	6	LAN2_1000_O
7	LAN2_100_10_G	8	LAN2_ACTIVE_Y

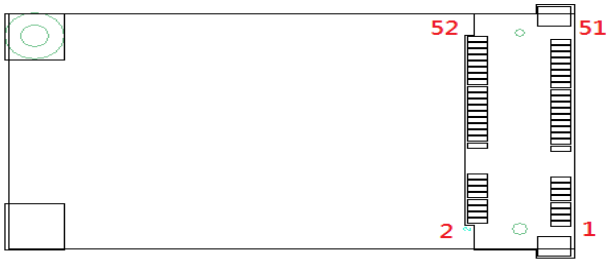
LVDS1: LVDS



Pin №	Signal Name	Pin №	Signal Name
1	LCDVDD	2	LVDS0_TX0_N
3	LCDVDD	4	LVDS0_TX0_P
5	LCDVDD	6	LVDS0_TX1_N
7	GND	8	LVDS0_TX1_P
9	GND	10	LVDS0_TX2_N
11	GND	12	LVDS0_TX2_P
13	GND	14	LVDS0_CLK_N
15	GND	16	LVDS0_CLK_P
17	GND	18	LVDS0_TX3_N
19	GND	20	LVDS0_TX3_P
21	GND	22	LVDS1_TX0_N
23	GND	24	LVDS1_TX0_P
25	GND	26	LVDS1_TX1_N
27	GND	28	LVDS1_TX1_P
29	GND	30	LVDS1_TX2_N
31	GND	32	LVDS1_TX2_P
33	GND	34	LVDS1_CLK_N
35	GND	36	LVDS1_CLK_P
37	GND	38	LVDS1_TX3_N
39	GND	40	LVDS1_TX3_P

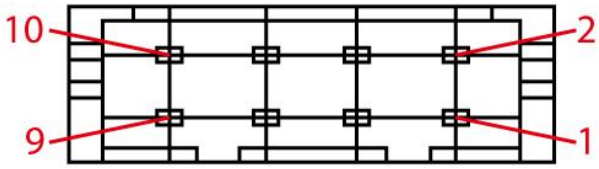
Note: Please refer to CON1 settings to select POWER RATING

MINI PCIE1: 3G/Wi-Fi



Pin №	Name	Pin №	Name
1	PCIE_WAKE#	2	+3.3V
3	NC	4	GND
5	BT_EN	6	+1.5V
7	CLK_OE#	8	USIM_PWR
9	GND	10	USIM_DATA
11	PCIE_CLKM	12	USIM_CLOCK
13	PCIE_CLKP	14	USIM_RESET
15	GND	16	USIM_VPP
17	NC	18	GND
19	NC	20	Wireless_ENABLE
21	GND	22	PCIE_RESET
23	PCIE_RXM	24	+3.3V
25	PCIE_RXP	26	GND
27	GND	28	+1.5V
29	GND	30	SMB_CLK
31	PCIE_TXM	32	SMB_DATA
33	PCIE_TXP	34	GND
35	GND	36	USB_D-
37	GND	38	USB_D+
39	+3.3V	40	GND
41	+3.3V	42	NC
43	GND	44	NC
45	NC	46	NC
47	NC	48	+1.5V
49	NC	50	GND
51	+3.3V	52	+3.3V

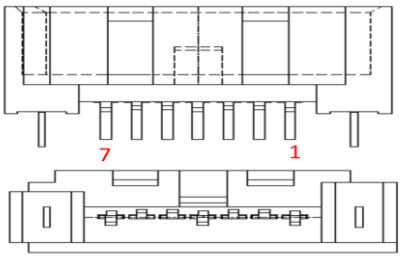
Panel1: OSD Membrane Control



Pin №	Name	Pin №	Name
1	+5V	2	+3.3V
3	GND	4	HDD_LED
5	PWRBTN#	6	GND
7	GND/ Backlight ADJ+	8	Reset
9	NC/Backlight ADJ-	10	+5V

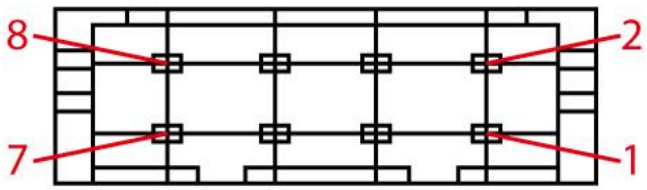
NOTE: Backlight ADJ+ / Backlight ADJ- optional functions

SATA1: SATA



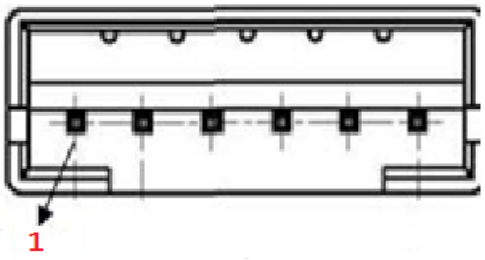
Pin №	Name	Pin №	Name
1	GND	2	SATA_TXP
3	SATA_TXN	4	GND
5	SATA_RXN	6	SATA_RXP
7	GND		

SATA_PWR1: SATA Power



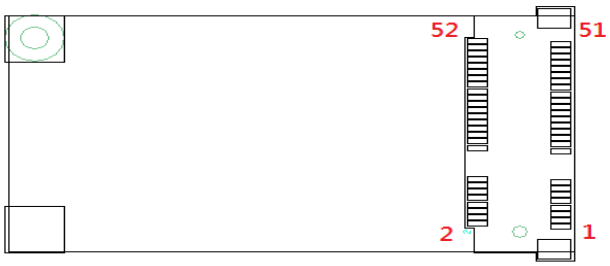
Pin №	Name	Pin №	Name
1	+12V	2	+12V
3	GND	4	GND
5	GND	6	GND
7	+5V	8	+5V

SIM1: Cable connector for SIM-100



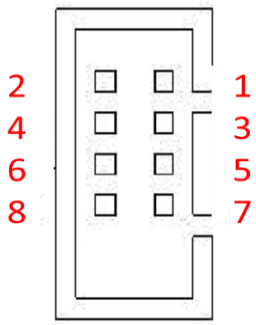
Pin №	Name	Pin №	Name
1	VREG_USIM	2	SIM_RESET
3	SIM_CLK	4	GND
5	SIM_VPP	6	SIM_DATA

SSD1: mSATA



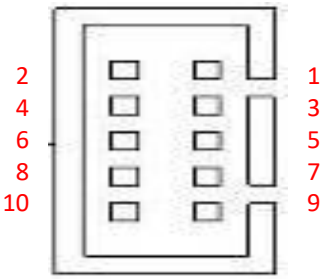
Pin №	Name	Pin №	Name
1	NC	2	+3.3V
3	NC	4	GND
5	NC	6	+1.5V
7	NC	8	NC
9	GND	10	NC
11	NC	12	NC
13	NC	14	NC
15	GND	16	NC
17	NC	18	GND
19	NC	20	NC
21	GND	22	NC
23	SATA_RXP	24	+3.3V
25	SATA_RXN	26	GND
27	GND	28	+1.5V
29	GND	30	SMB_Clock
31	SATA_TXN	32	SMB_Data
33	SATA_TXP	34	GND
35	GND	36	NC
37	GND	38	NC
39	+3.3V	40	GND
41	+3.3V	42	NC
43	GND	44	NC
45	NC	46	NC
47	NC	48	+1.5V
49	SSD_LED#	50	GND
51	NC	52	+3.3V

USB2, USB3: Internal USB2.0



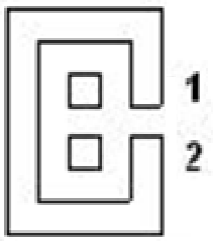
Pin №	Name	Pin №	Name
1	+5V	2	+5V
3	USB_D-	4	USB_D-
5	USB_D+	6	USB_D+
7	GND	8	GND

VGA1: VGA Signal



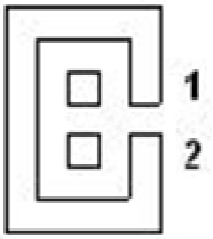
Pin №	Name	Pin №	Name
1	DDC_DATA	2	+5V
3	DDC_CLOCK	4	RED
5	Horizontal Sync	6	GREEN
7	Vertical Sync	8	BLUE
9	GND	10	GND

3V1: 3.3V output



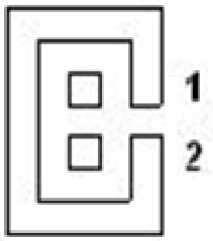
Pin №	Name
1	+3.3V
2	GND

5V1: 5V output



Pin №	Name
1	+5V
2	GND

12V1: 12V output



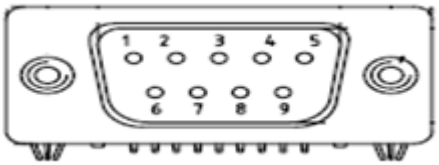
Pin №	Name
1	+12V
2	GND

2.5.2 I/O Side Setting Description

The table below shows each of I/O side connectors and its functions.

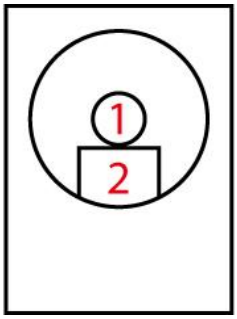
Label	Function	Note
COM1	Serial port (RS232/422/485)	D-sub9 Male
DCJACK1	DC JACK	2.5Ø DC Jack
HDMI	HDMI Signal	HDMI Type A
LAN1	Gigabit Ethernet	RJ45+LED
LAN2	Gigabit Ethernet	RJ45+LED
USB	USB 2.0 / USB 3.0	USB Type A

COM1: D-Sub 9



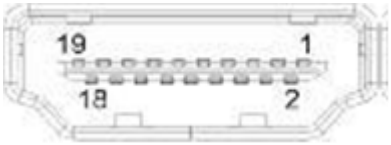
Pin №	RS232	RS422	RS485
1	DCD	TxD-	D-
2	RXD	TxD+	D+
3	TXD	RxD+	NC
4	DTR	RxD-	NC
5	GND	GND	GND
6	DSR	NC	NC
7	RTS	NC	NC
8	CTS	NC	NC
9	RI	NC	NC

DCJACK1: DC Jack1 (optional)



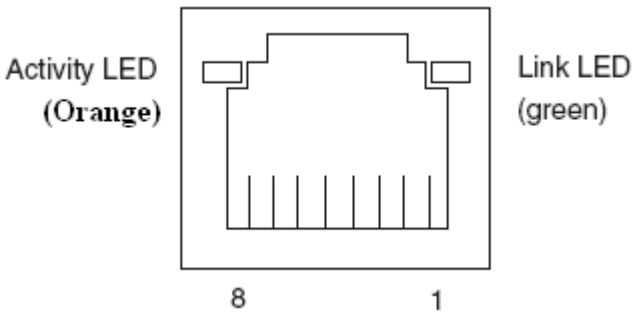
Pin №	Name	Pin №	Name
1	DC_IN	2	GND

HDMI: HDMI Type A



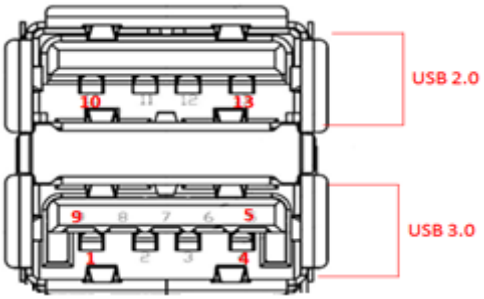
Pin №	Name	Pin №	Name
1	TMDS_DATA2+	2	GND
3	TMDS_DATA2-	4	TMDS_DATA1+
5	GND	6	TMDS_DATA1-
7	TMDS_DATA0+	8	GND
9	TMDS_DATA0-	10	TMDS_CLOCK+
11	GND	12	TMDS_CLOCK-
13	CEC	14	NC
15	DDC_CLOCK	16	DDC_DATA
17	GND	18	5V
19	Hot Plug Detect		

LAN1, LAN2: Gigabit Ethernet



Pin №	Name	Pin №	Name
1	TX1+	2	TX1-
3	TX2+	4	TX2-
5	TX3+	6	TX3-
7	TX4+	8	TX4-

2 USB: USB 2.0 / USB 3.0



Pin №	Name	Pin №	Name
1	+5V	2	USB_D-
3	USB_D+	4	GND
5	STDA_SSRX-	6	STDA_SSRX+
7	GND_DRAIN	8	STDA_SSTX-
9	STDA_SSTX+	10	+5V
11	USB_D-	12	USB_D+
13	GND		

AMI BIOS Setup

CHAPTER 3

This chapter contains BIOS Configuration
and OS Recovery information.

3.1 When and How to Use BIOS Setup
3.2 BIOS Functions
3.3 Using Recovery Wizard to Restore Computer

Chapter 3 AMI BIOS SETUP

3.1 When and How to Use BIOS Setup

To enter the BIOS setup, you need to connect an external USB keyboard, press Del key when the prompt appears on the screen during start up. The prompt screen shows only few seconds so need press Del key quickly.

IMPORTANT:
Updated BIOS version may be published after the manual released. Check the latest version of BIOS on the website.

You may need to run BIOS setup utility for reasons listed below:

1. Error message on screen indicates to check BIOS setup
2. Restoring the factory default settings.
3. Modifying the specific hardware specifications
4. Necessity to optimize specifications

BIOS Navigation Keys

The following keys are enabled during POST:

Key	Function
Del	Enters the BIOS setup menu.
F7	Display the boot menu. Lists all bootable devices that are connected to the system. With cursor ↑and cursor ↓and by pressing <ENTER>, select the device used for the boot.
Pause	Pressing the [Pause] key stops the POST. Press any other key to resume the POST.

The following Keys can be used after entering the BIOS Setup.

Key	Function
F1	General Help
F2	Previous Values
F3	Optimized Defaults
F4	Save & Exit
Esc	Exit
+/-	Change Opt.
Enter	Select or execute command
Cursor ↑	Moves to the previous item
Cursor ↓	Goes to the next item
Cursor ←	Moves to the previous item
Cursor →	Goes to the next item

	NOTE: You can press the F1, F2, F3, F4, –/+, and Esc keys by connecting a USB keyboard to your computer.

3.2 BIOS Functions

3.2.1 Main Menu

When you enter BIOS setup, the first menu that appears on the screen is the main menu. The Main menu displays the basic information about yoursystem including BIOS version, processor RC version, system language, time, and date. It contains the system information including BIOS version, processor RC version, system language, time, and date.

BIOS Setting	Description	Setting Option	Effect
System Language	Displays the system language. [English] is set up by default.	Adjustment of the language	Set the language in other language. The language in this device is English.
System Date/Time	This is current date setting. The time is maintained by the battery when the device is turned off.	Date and time changes.	Set the date in the format [mm/dd/yyyy]; The time in the format: [hh/mm/ss]
Access Level	The current user access settings	Changes to the level of access	Administrator is set up by the default

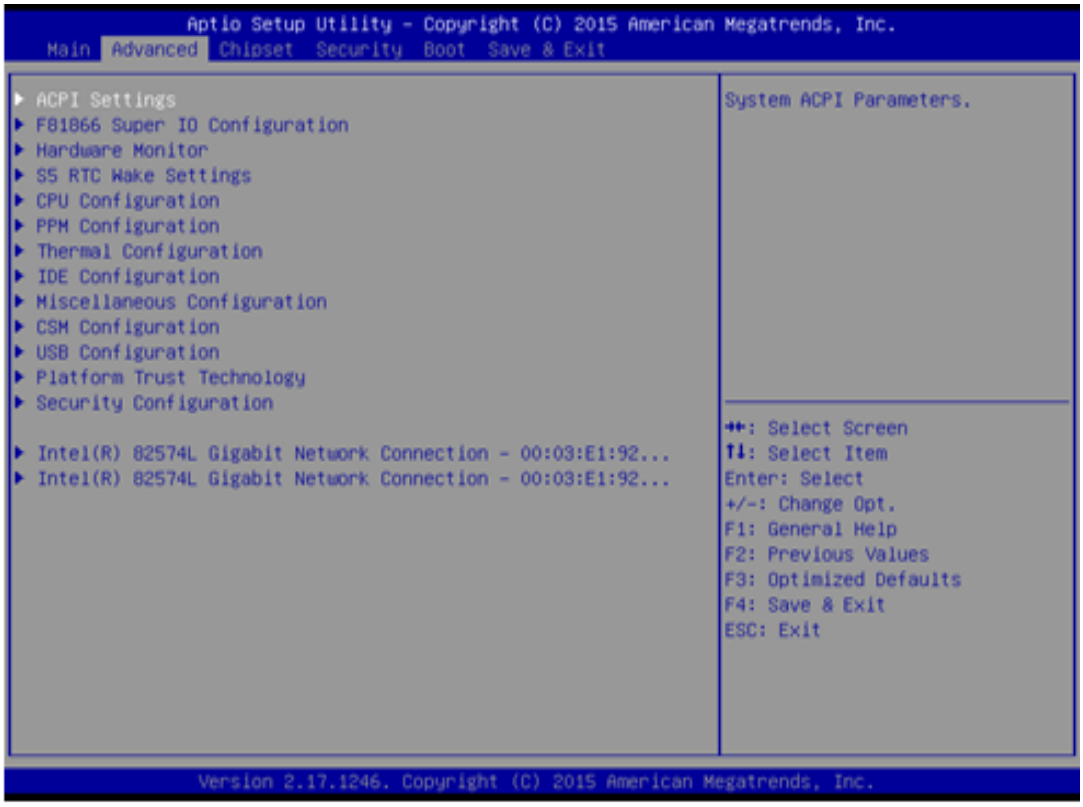
3.2.2 Advanced Menu

The advanced menu also uses to set configuration of the CPU and other system devices. There are sub menus on the left frame of the screen.

Handle advanced BIOS settings page with caution. Any changes can affect the operation of your computer.

Note

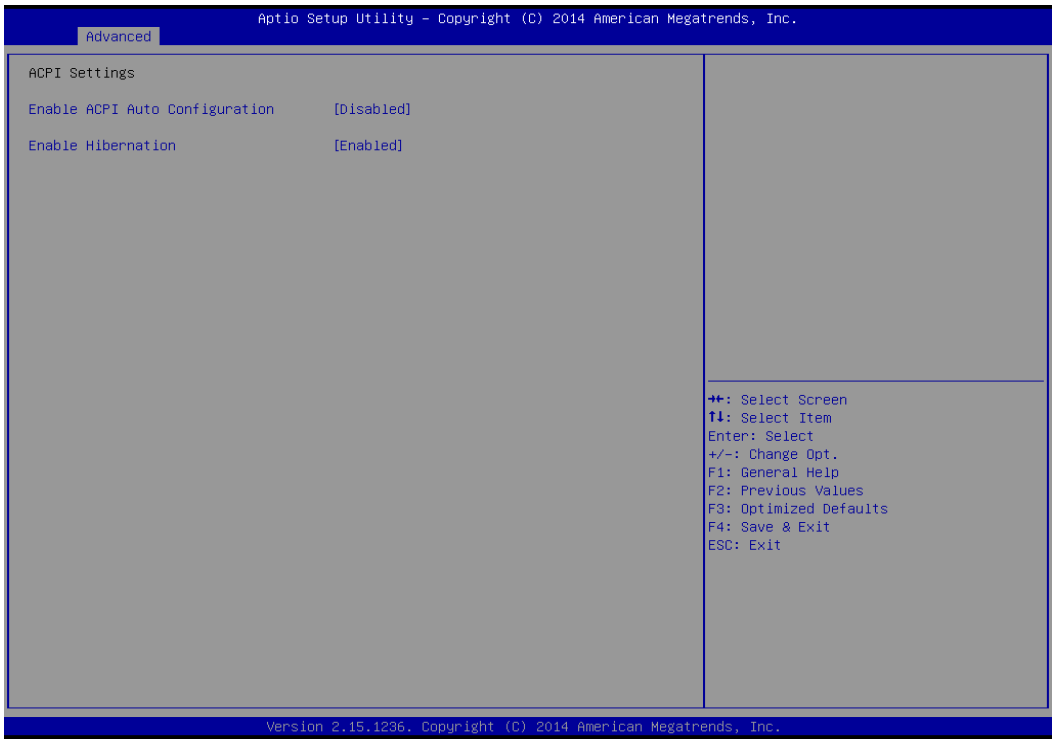
For items marked ► press **<Enter>** for more options.
Advanced Configuration and Power Interface (ACPI) settings allow to control how the power switch operates. The power supply can be adjusted for power requirements. You can use the screen to select options of ACPI configuration. A description of the selected items will appear on the right side of the screen.



BIOS Setting	Description	Setting Option	Effect
ACPI Settings	Configures ACPI settings	Enter	Opens submenu
F81866 Super IO Configuration	Configures IO settings	Enter	Opens submenu
Hardware Monitor	Configures Hardware Monitor settings	Enter	Opens submenu
S5 RTC Wake Settings	Configures RTC Wake parameters	Enter	Opens submenu
CPU Configuration	Configures CPU settings	Enter	Opens submenu
PPM Configuration	Configures PPM settings	Enter	Opens submenu
Thermal Configuration	Configures Thermal Parameters	Enter	Opens submenu
IDE Configuration	Configures IDE Parameters	Enter	Opens submenu
Miscellaneous Configuration	Configures Miscellaneous Parameters	Enter	Opens submenu
CSM Configuration	Configures CSM Parameters	Enter	Opens submenu

USB Configuration	Configures USB Settings	Enter	Opens submenu
Platform Trust Technology	Configures Platform Trust Technology parameters	Enter	Opens submenu
Security Configuration	Configures Security parameters	Enter	Opens submenu

3.2.2.1 ACPI Settings



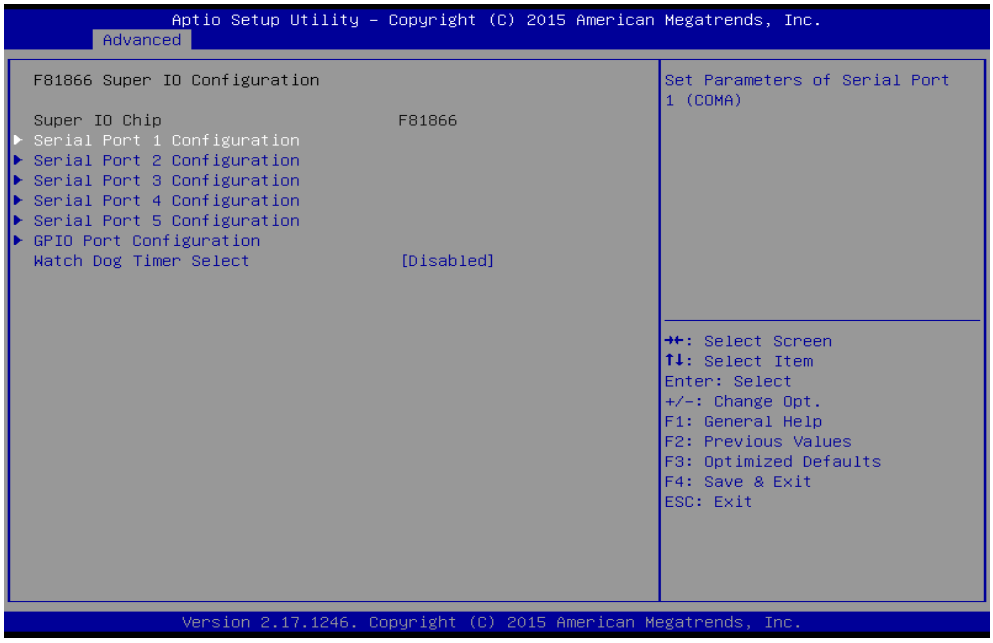
BIOS Setting	Description	Setting Option	Effect
Enable ACPI Auto Configuration	BIOS ACPI Auto Configuration	Enable/ Disable	Enables or Disables this function
Enable Hibernation	Control hibernation	Enable/ Disable	Enables or Disables this function

3.2.2.2 F81866 Super IO Configuration

You can use the screen to select options for Super IO Configuration, and change the value of the option selected. A description of the selected item appears on the right side of the screen. For items marked with ►, please press **<Enter>** for more options.

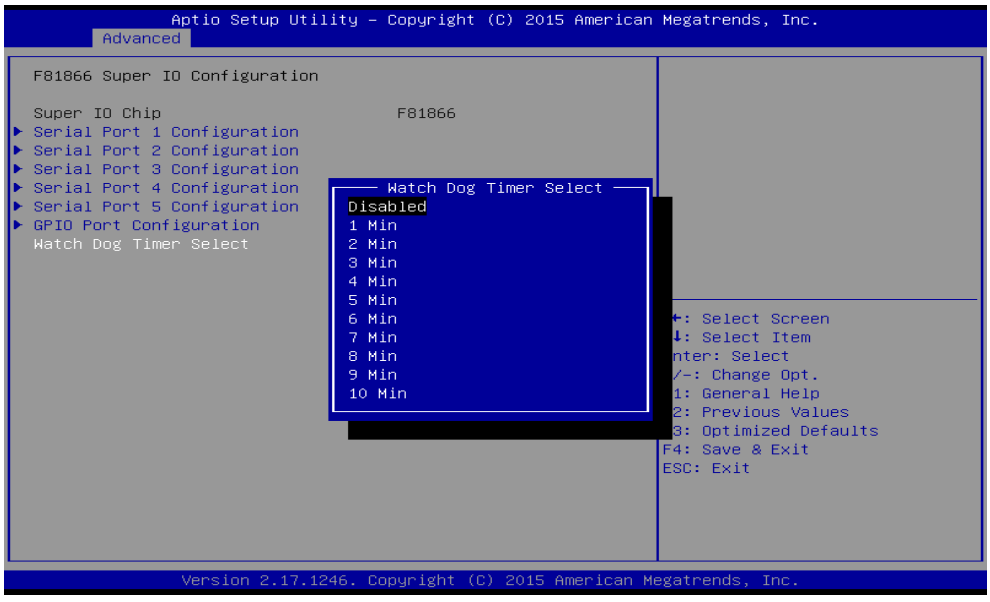
Serial Port 1~5

Use these items to set parameters related to serial port 1~5.



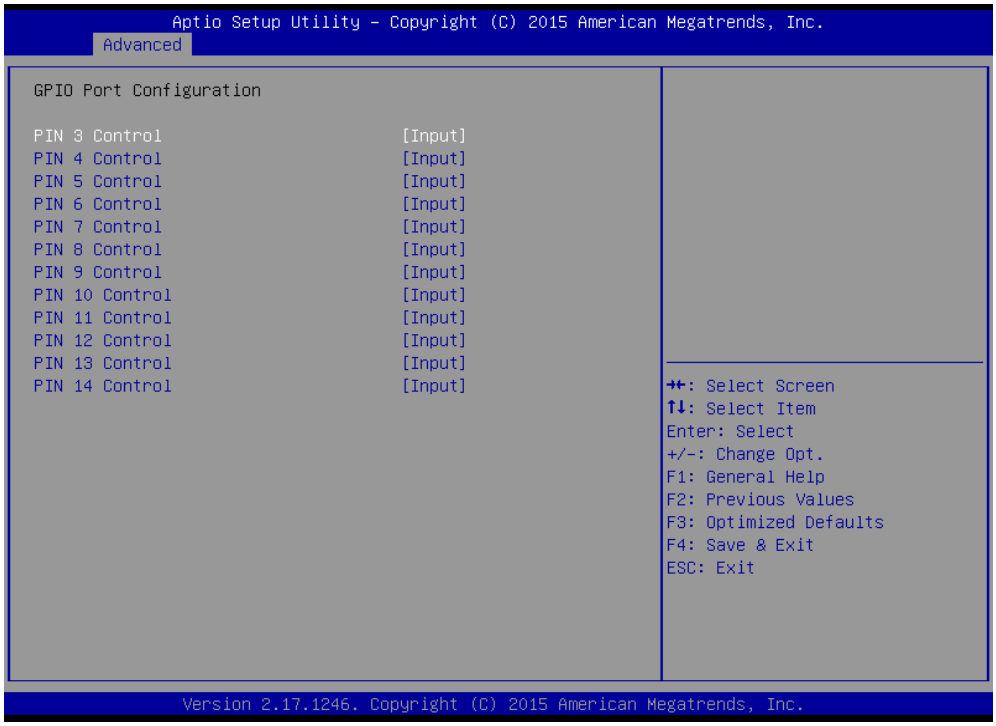
Watch Dog Time Select

You can either disable **Watch Dog Time Select**, or set up the time.Use **<Arrow>** keys to navigate and please press **<Enter>** to select the item.



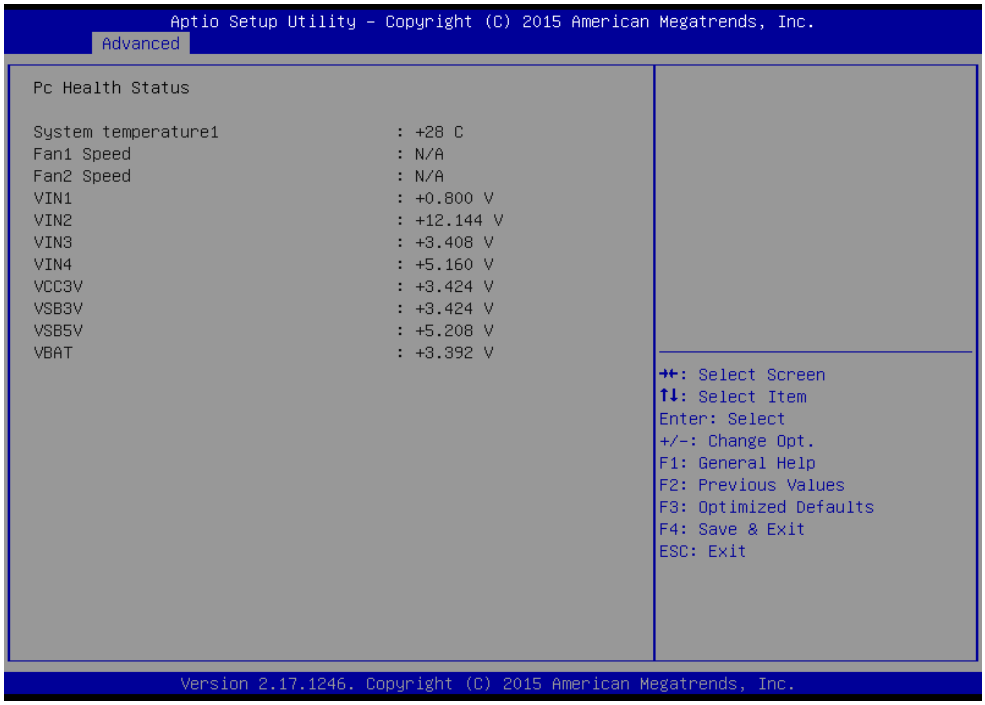
GPI0 Port Configuration

You can use the screen to change GPI0 Port setting. Use these items to set parameters related to **PIN3-PIN14 Control**.



3.2.2.3 Hardware Monitor

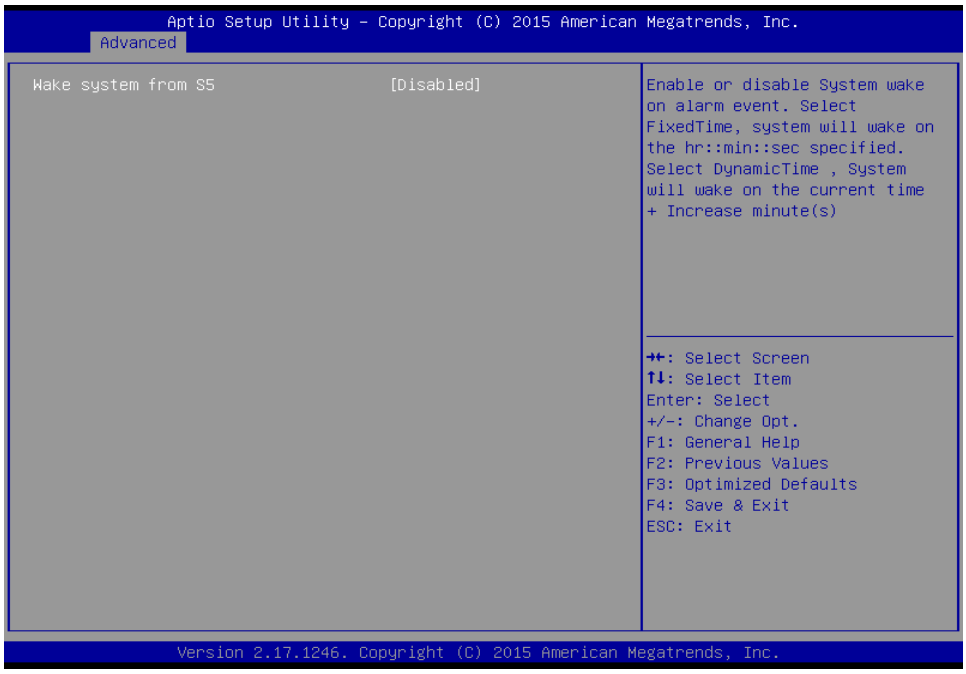
You can check PC Health Status parameters such as system temperature, fan speed etc.



3.2.2.4 S5 RTC Wake Settings

Wake System from S5 with fixed time setting

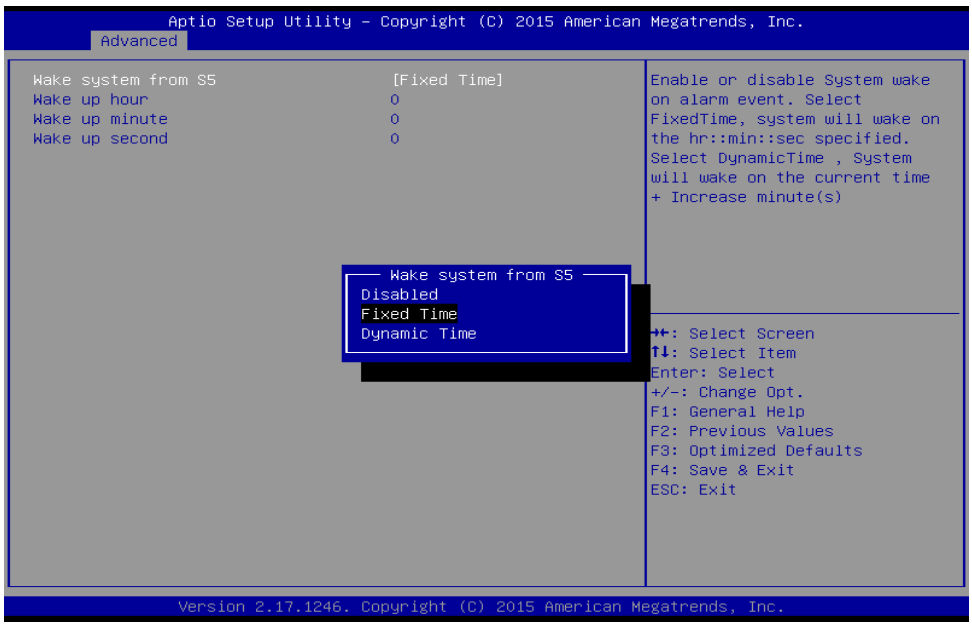
Wake system from S5 enables or disables system wake on alarm event. It allows you to wake up the system in a certain time.



Select **Fixed Time** to set the system to wake on the specified time.

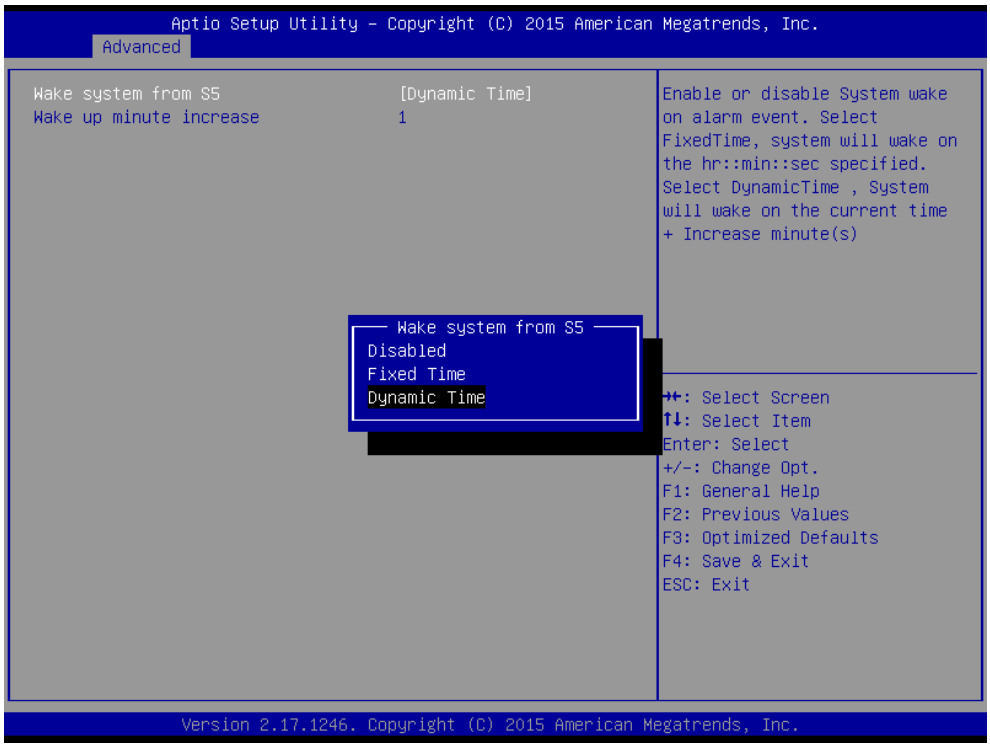
Use Navigation Keys ⬆ ⬇ to switch among the items: Day, Hour, Minute and Second. Type the desired value in the selected item.

For example, if you want the system to start up automatically at 15:30:30, the 10th day of each month, then you should enter 10, 15, 30, and 30 from top to bottom.



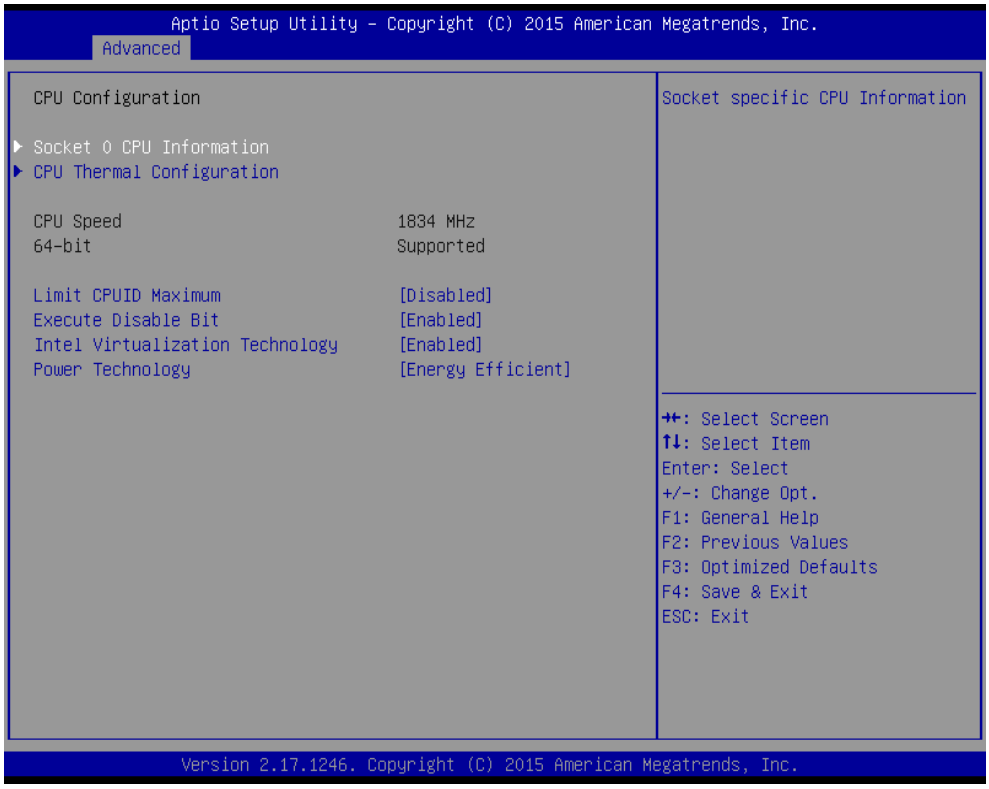
Wake system from S5 after dynamic time setting

Select **Dynamic Time** to set the system to wake on the current time + increase minute (s).



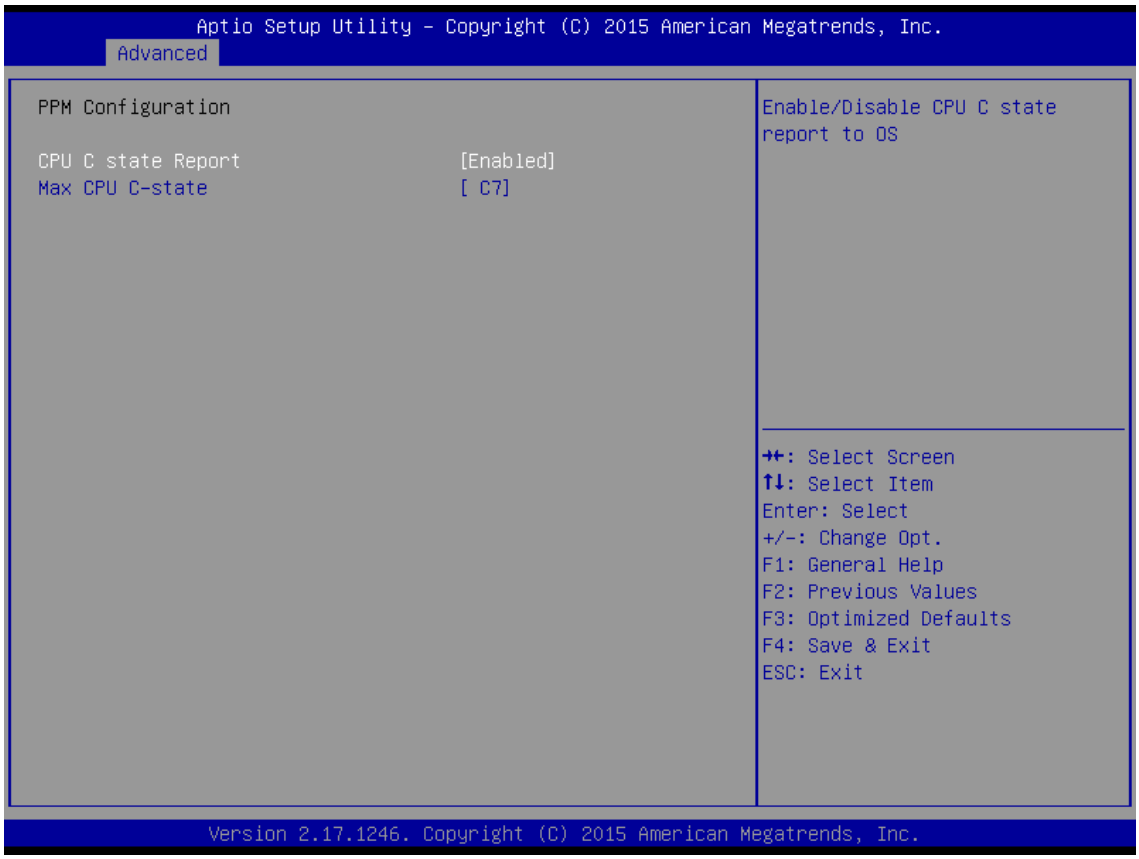
3.2.2.5 CPU Configuration

Press **<Enter>** to view current CPU configuration and make settings for the following sub-items.



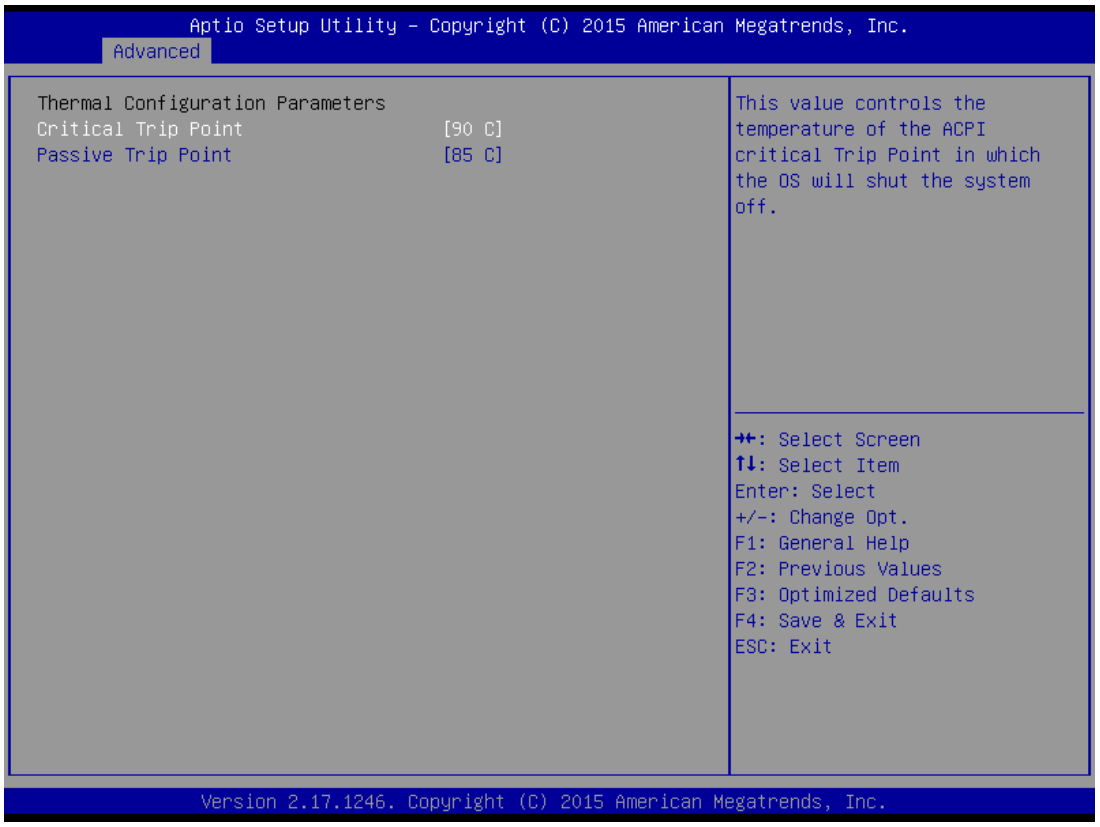
BIOS Setting	Description	Setting Option	Effect
Socket CPU Information	This item contains socket specific CPU information.	Enter	Open sub-menu
CPU Thermal Configuration	Thermal control	Enter	Open sub-menu
Limit CPUID Maximum	Limits CPIID Maximum	Disabled/ Enabled	Enable/Disable this function
Execute Disable Bit	Execute Disable Bit	Disabled/ Enabled	Enable/Disable this function
Intel Virtualization Technology	Allows to run recent OS and applications	Enabled/ Disabled	Enable/Disable this function
Power Technology	Control the performance and power management functions of the processors	Disabled	Disable this function
		Energy Efficient	Work on energy efficient mode

3.2.2.6 PPM Configuration



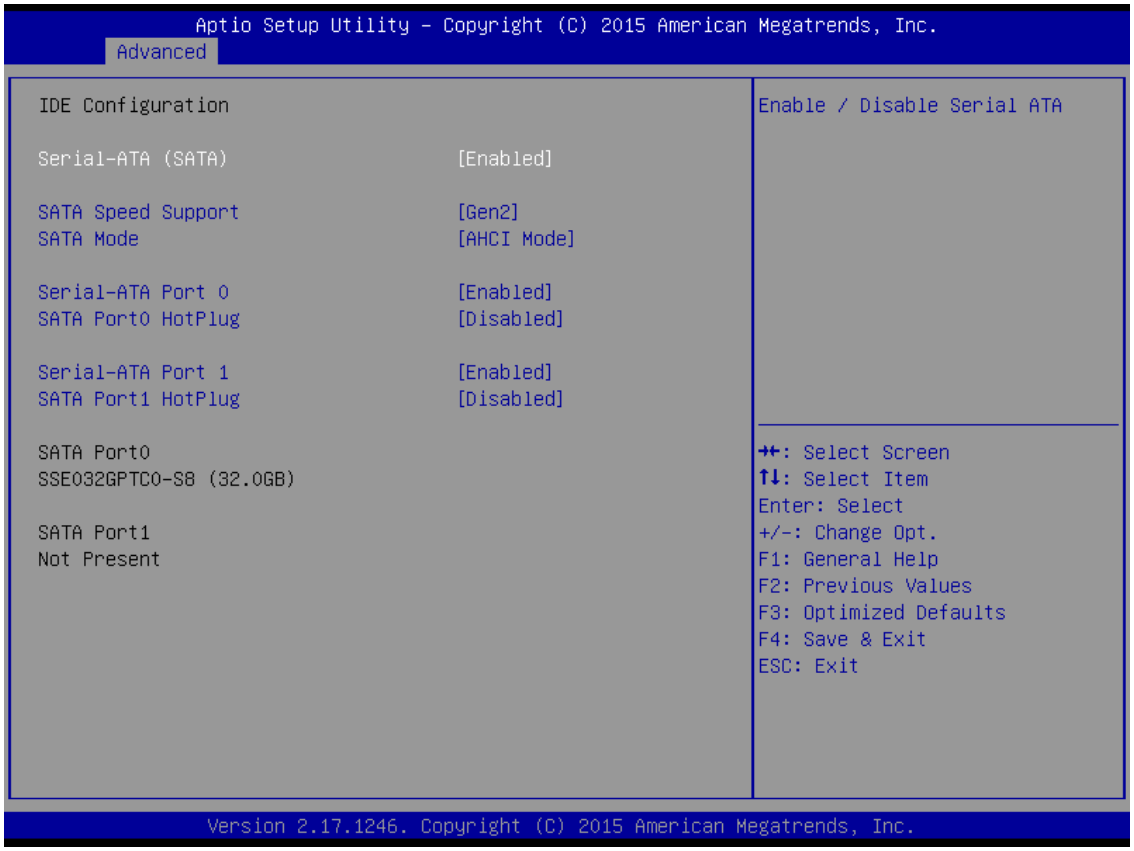
BIOS Setting	Description	Setting Option	Effect
CPU C State Report	Shows CPU C State Report	Enabled/ Disabled	Enable or Disable CPU C state report to OS
Max CPU C-State	Allows to enter power-saving mode in order to save energy	C1E, C3, C6, C7, Auto	Enable or Disable CPU C Max CPU S-Sate

3.2.2.7 Thermal Configuration



BIOS Setting	Description	Setting Option	Effect
Critical Trip Point	Specifies the temperature at which the OS will shut down the system	90C, 87C, 85C, 79C, 71C, 63C,55C,47C, 39C, 31C, 23C, 15C	Select the disable temperature for the system to shut down
Passive Trip Point	Specifies the temperature at which the OS will begin adjusting the processor	90C, 87C, 85C, 79C, 71C, 63C,55C,47C, 39C, 31C, 23C, 15C	Select the disable temperature for the system to start adjusting the processor

3.2.2.8 IDE Configuration



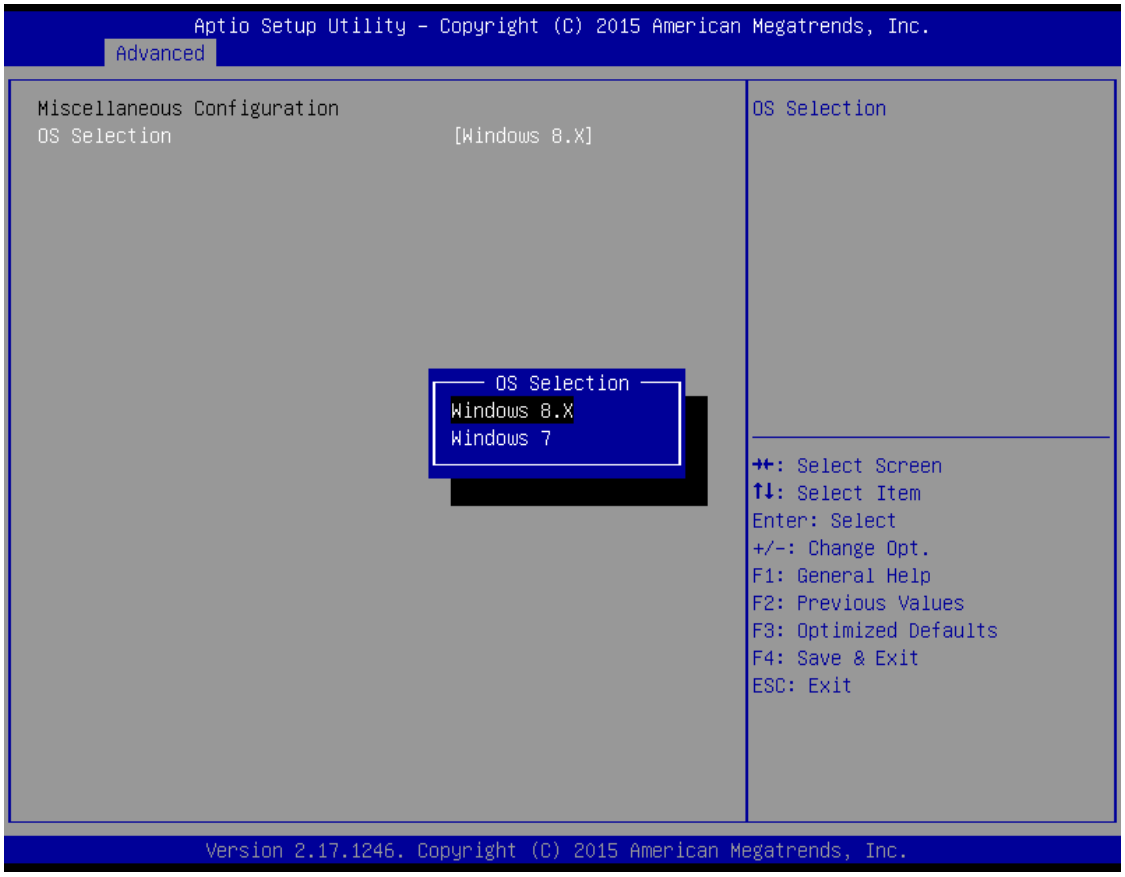
BIOS Setting	Description	Setting Option	Effect
Serial- ATA (SATA)	Responsible for supporting chipset drives with SATA interface.	Enabled/ Disabled	Enable or disable this function
SATA Speed Support	Allows forcing the speed limit SATA II ports standard IDE / SATA-controller chipset.	Gen1	The maximum speed will be limited to 150 MB/s
		Gen2	The maximum speed will be limited to 300 MB/s
		Disabled	Disables manual configuration of SATA II ports (mode will be selected based on the specifications of connected drives)
SATA Mode	This option specifies the operation mode of modern IDE / SATA-controller chipset	[AHCI]	Selecting this option allows you to take full advantage of the extended host controller

			SATA II
		[IDE]	SATA controller will operate in a mechanism similar to a conventional IDE-controller
		[RAID]	Allows combining hard drives in RAID-arrays in order to improve the reliability of data storage, or to increase the speed.
Serial- ATA Port 0	The option turns on or off Port 0 of SATA channels of standard IDE / SATA-controller chipset.	Enabled/ Disabled	Turn on (Enabled) or turn off (Disabled) Port 0
SATA Port0 HotPlug	This feature that allows you to attach and remove a SATA Port0	Enabled/ Disabled	Enable or disable this function
Serial- ATA Port 1	The option turns on or off Port 1 of SATA channels of standard IDE / SATA-controller chipset.	Enabled/ Disabled	Turn on (Enabled) or turn off (Disabled) Port 1
SATA Port1 HotPlug	This feature that allows you to attach and remove a SATA Port1	Enabled/ Disabled	Enable or disable this function

3.2.2.9 Miscellaneous Configuration

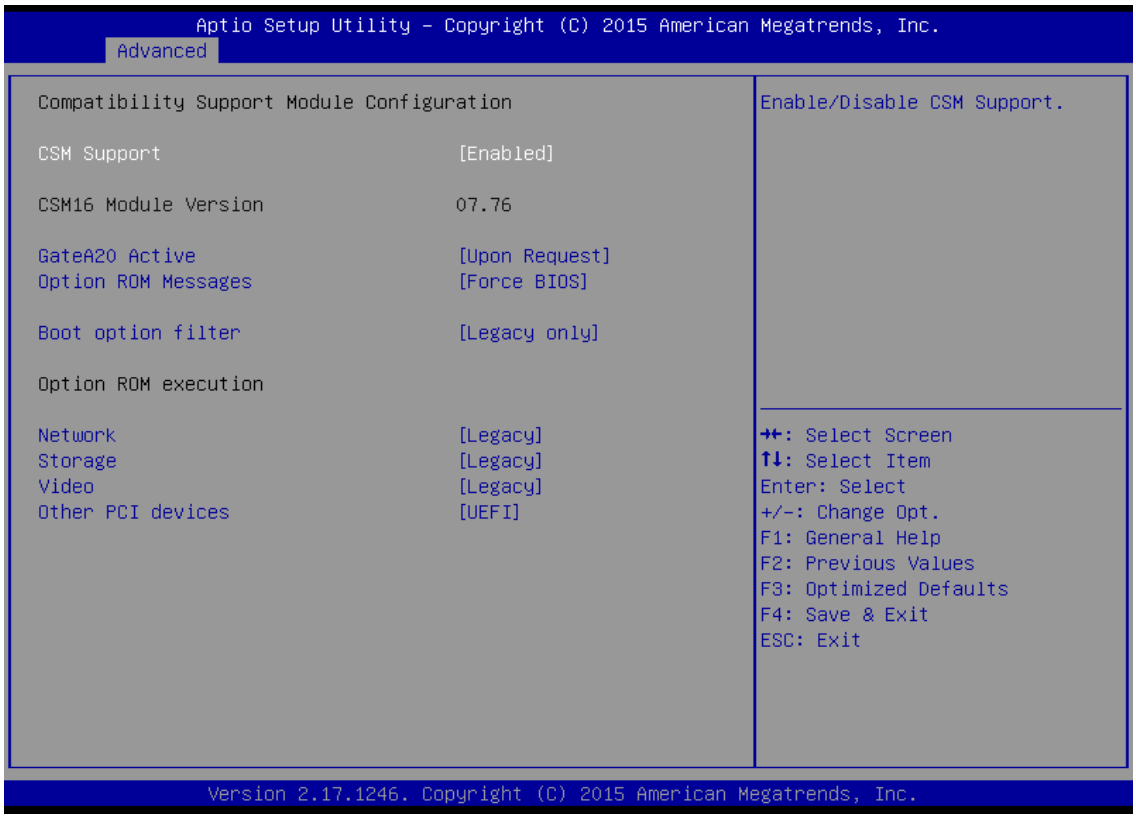
OS Selection

This item allows users to select the proper Operating System.



BIOS Setting	Description	Setting Option	Effect
Windows 8.X	Allows user to choose the proper OS.	Enter	Use Windows 8.X
Windows 7	Allows user to choose the proper OS.	Enter	Use Windows 7

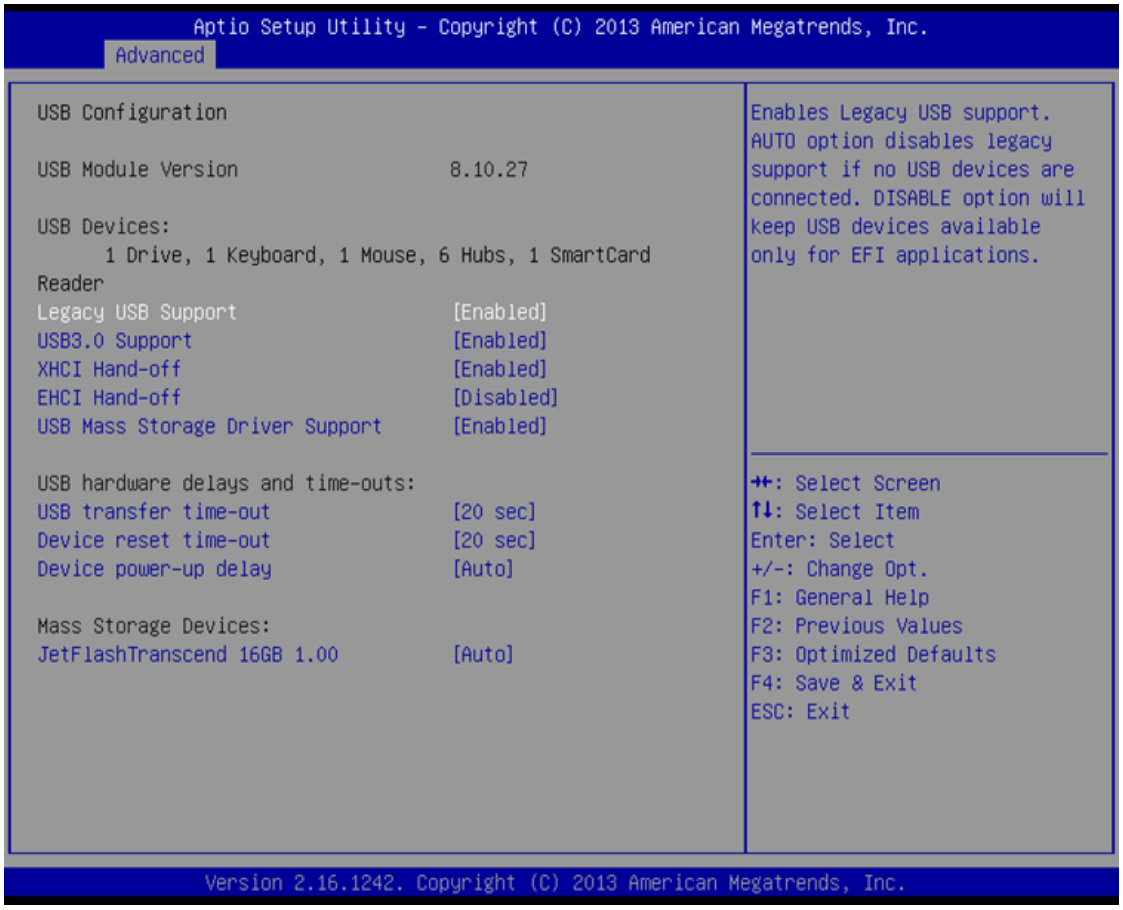
3.2.2.10 CSM Configuration



BIOS Setting	Description	Setting Option	Effect
CSM Support	The Compatibility Support Module (CSM) is a component of the UEFI firmware that provides legacy BIOS compatibility by emulating a BIOS environment, allowing legacy operating systems and some option ROMs that do not support UEFI to still be used.	Enabled/ Disabled	Enable or disable the Compatibility Support Module
GetaA20 Active	Activate GetaA20	Upon Request	Enable or disable this function
Option ROM Messages	Receiving ROM Messages Settings	Force BIOS	Set ROM messages parameters
Network	Specifies which Network option ROM is booted	UEFI	Only UEFI option ROMs

			are booted
		Legacy	
Storage	Specifies which Storage option ROM is booted	UEFI	Only UEFI option ROMs are booted
		Legacy	Only Legacy option ROMs are booted
Video	Specifies which Video option ROM is booted	UEFI	Only UEFI option ROMs are booted
		Legacy	Only Legacy option ROMs are booted
Other PCI Devices	Specifies which option ROM is booted for devices other than the network, storage or video	UEFI	Only UEFI option ROMs are booted
		Legacy	Only Legacy option ROMs are booted

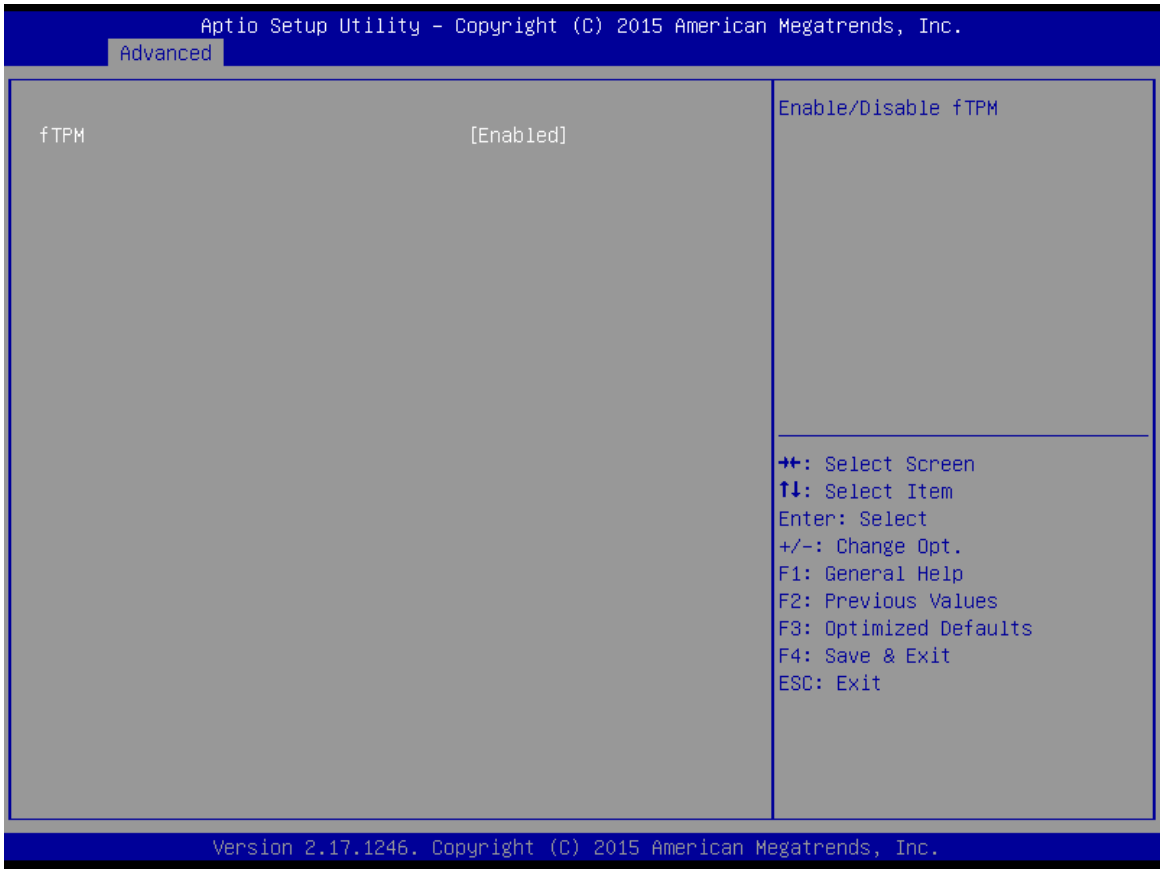
3.2.2.11 USB Configuration



BIOS Setting	Description	Setting Option	Effect
Legacy USB Support	User can enable or disable USB port.	Disable	Will keep USB devices available only for EFI applications.
		Enable	Enable all the USB devices
USB 3.0 Support	User can enable or disable USB 3.0 (XHCI) controller support.	Enable	Enable USB 3.0 is enable
		Disable	USB 3.0 is disable
XHCI Hand-off	This is a workaround for OSs without XHCI hand- off support.	Disable	Disables this function
		Enable	Enables this function
EHCI Hand-off	This is a workaround for OSs without ECHI hand- off	Disable	Disables this function

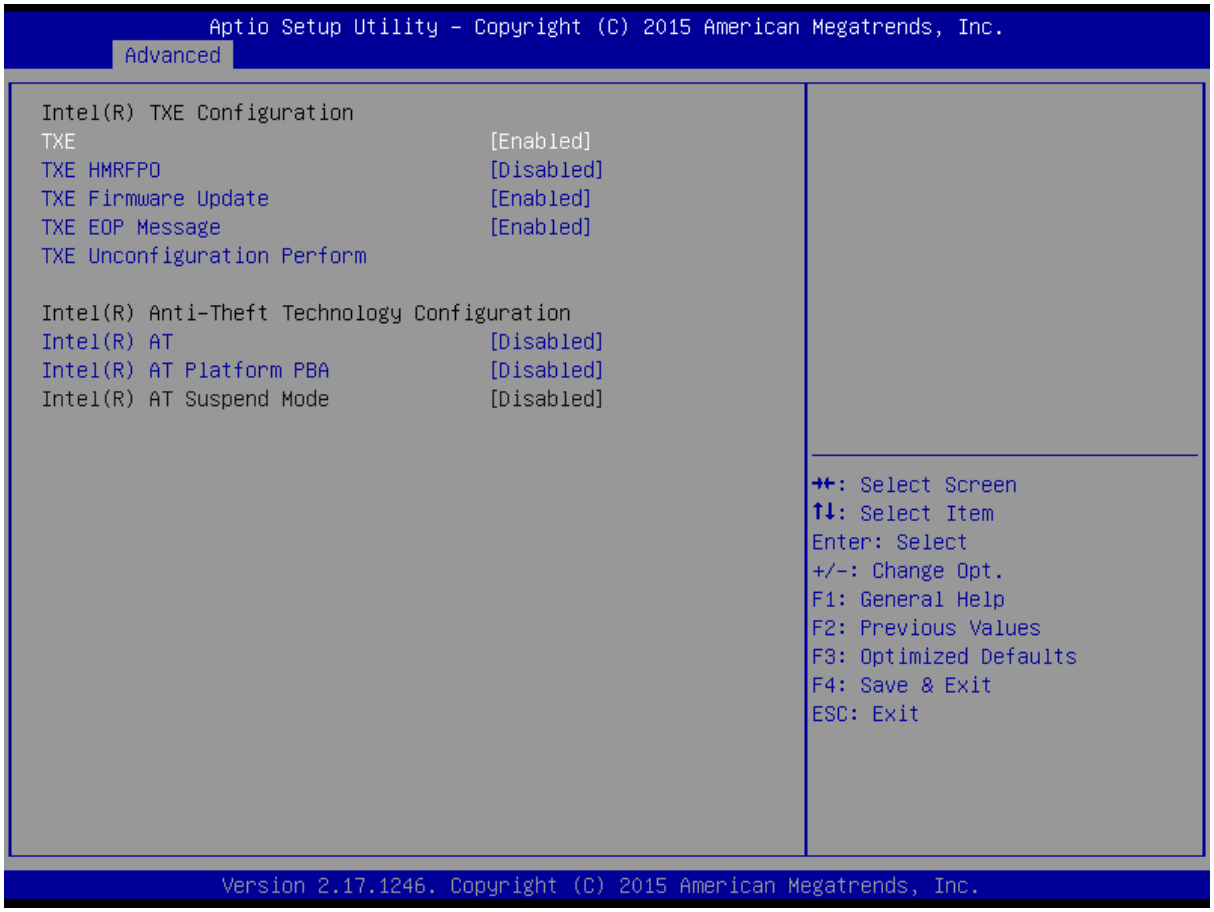
	support.	Enable	Enables this function
USB mass storage driver support	User can Enable or disable USB mass storage driver support.	Disable	Disables this function
		Enable	Enables this function
USB Transfer time- out	The time-out value for control, bulk, and interrupt transfers.	1 Sec 5 Sec 10 Sec 20 Sec	Depends on the time-out value
Device Reset time- out	USB mass storage device start unit command time- out.	10 Sec 20 Sec 30 Sec 40 Sec	Depends on the time-out value
Device power-up delay	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 from Hub descriptor

3.2.2.12 Platform Trust Technology



BIOS Setting	Description	Setting Option	Effect
fTPM	Trusted Platform Module parameters	Enabled/Disabled	Enables or disables this function

Security Configuration



BIOS Setting	Description	Setting Option	Effect
TXE	Trusted Execution Technology parameters	Enabled/Disabled	Enables or disables this function
TXE HMRFPO	TXE HMRFPO parameters	Enabled/Disabled	Enables or disables this function
TXE Firmware Update	TXE Firmware Update parameters	Enabled/Disabled	Enables or disables this function
TXE EOP Message	TXE EOP Message parameters	Enabled/Disabled	Enables or disables this function
Intel ® AT	Intel ® AT parameters	Enabled/Disabled	Enables or disables this function
Intel ® AT Platform PBA	Intel ® AT Platform PBA parameters	Enabled/Disabled	Enables or disables this function

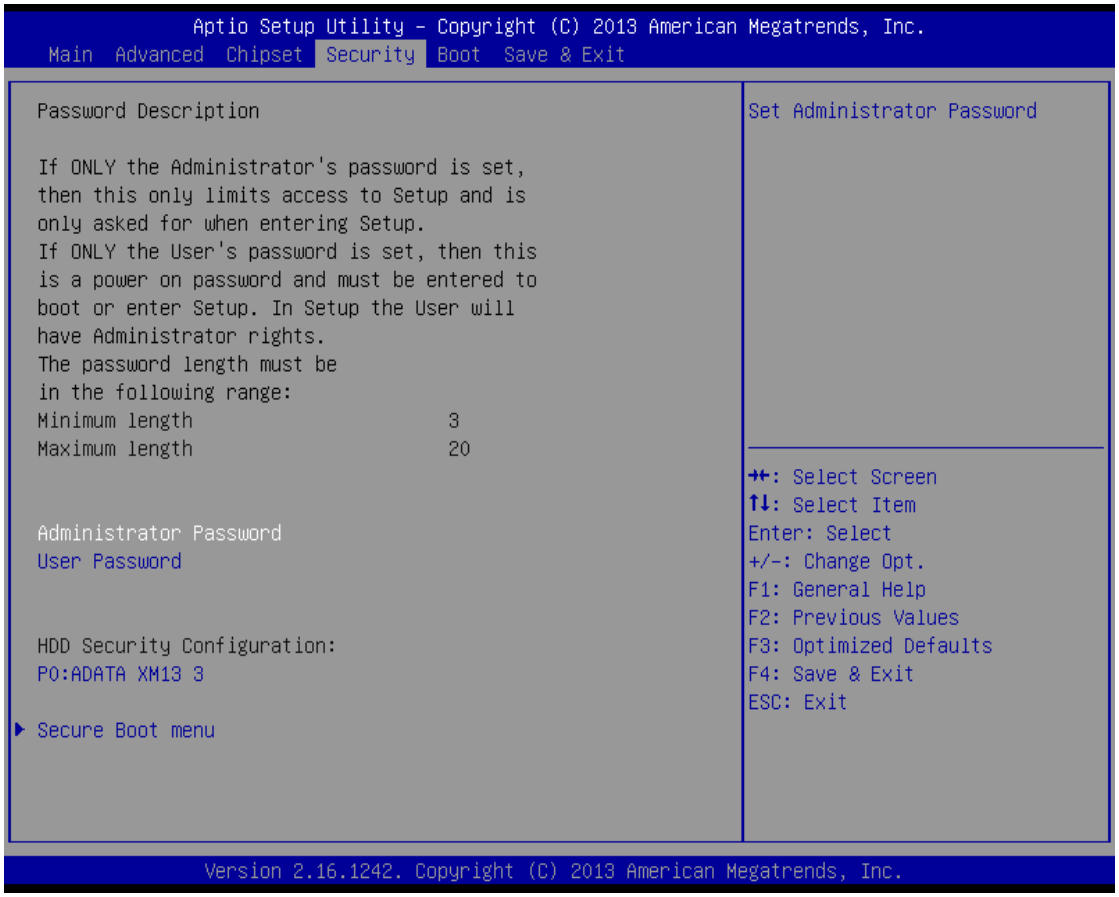
3.2.3 Chipset Menu

For items marked with ►, please press **<Enter>** for more options.

BIOS Setting	Description	Setting Option	Effect
High Precious Timer	Allow to set up High Precious Timer settings	Enabled/ Disabled	Enables/Disables this function
Restore AC Power Loss	This function allows to set up booting options after a power failure	Power on/ Power off	Boot automatically after a power failure
Serial IRQ Mode	When working with personal computer hardware, installing and removing devices, the system relies on interrupt requests. Interrupt request	Continuous	Allow user to set up desired IRQ Mode

3.2.4 Security Menu

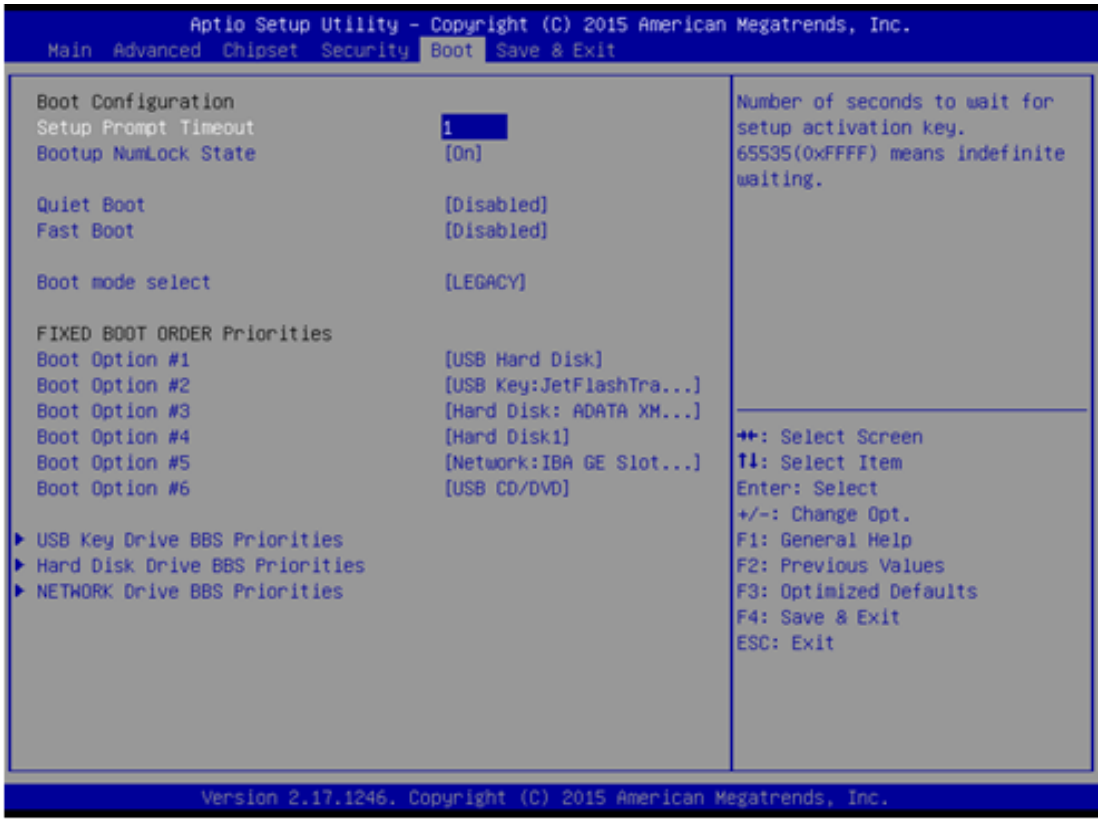
In the Security menu, users can set administrator password, user password, and HDD security configuration.



BIOS Setting	Description	Setting Option	Effect
Administrator Password	Displays whether or not an administrator password has been set.	Enter	Enter password
User Password	Display whether or not a user Password has been set.	Enter	Enter password

3.2.5 Boot Configuration

The Boot menu sets the sequence of the devices to be searched for the operating system. The bootable devices will be automatically detected during POST and shown here, allowing you to set the sequence that the BIOS use to look for a boot device from which to load the operating system.

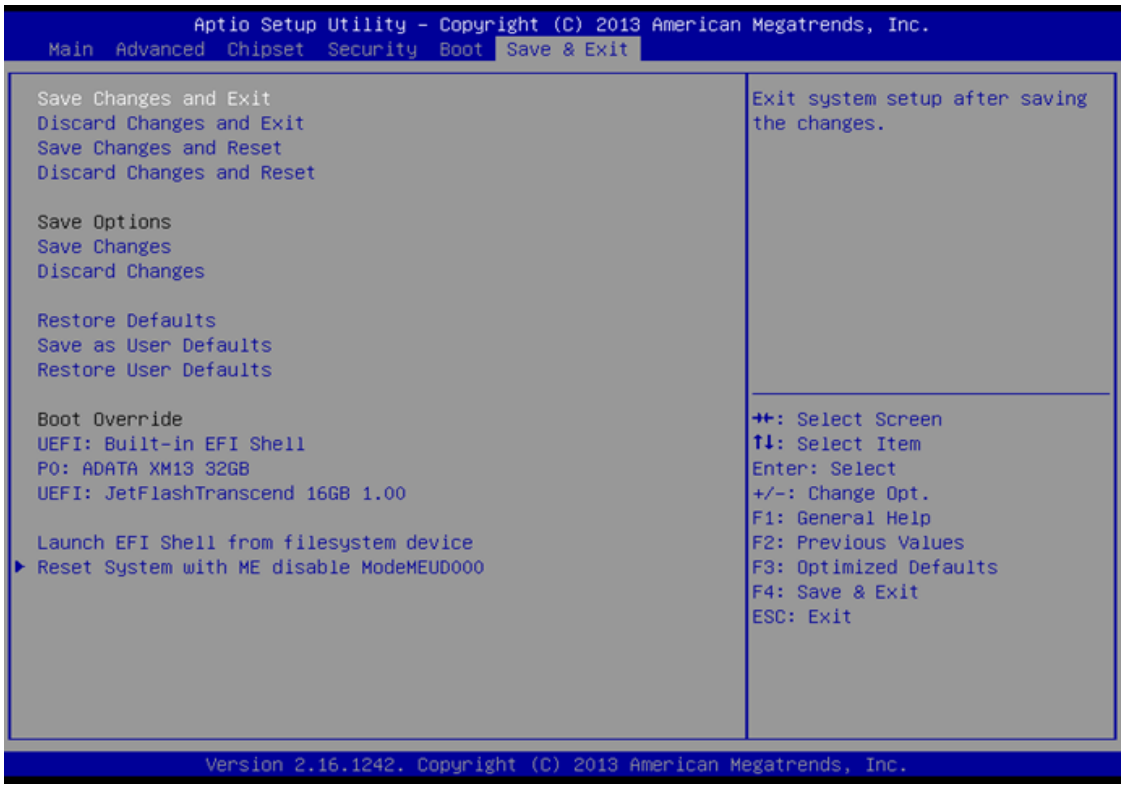


BIOS Setting	Description	Setting Option	Effect
Setup Prompt Timeout	Allows user to configure the number of seconds to stay in BIOS setup prompt screen.	Enter	Set the prompt timeout
Boot NumLock State	Enables or disables NumLock feature on the numeric keypad of the keyboard after the POST (Default: On).	On	Remains On
		Off	Remains OFF
Quite Boot	Determines if POST message or	Disabled	Disables this

	OEM logo (default = Black background) is displayed.		function
		Enabled	Enables this function
Fast Boot	Enables or disables Fast Boot to shorten the OS boot process. (Default: Disabled).	Disabled	Disables this function
		Enabled	Enables this function
Boot Mode Select	Specifies which mode will be used for booting	Legacy	Only Legacy option is booted
		UEFI	Only UEFI option is booted
Boot Option #1~#6	Specifies the overall boot order from the available devices	Ex: Boot Option#1 (hard drive)	Hard drive as the first priority
USB Key Drive BBS Priorities	USB Key Drive BBS Priorities	Enter	Open sub-menu
Hard Disk Drive BBS Priorities	Hard Disk Drive BBS Priorities	Enter	Open sub-menu
Network Drive BBS Priorities	Network Drive BBS Priorities	Enter	Open sub-menu

3.2.6 Save & Exit

The Exit menu displays a way how to exit BIOS Setup utility. After finishing your settings, you must save and exit for changes to be applied.



BIOS Setting	Description	Setting Option	Effect
Save Changes and Exit	This saves the changes to the CMOS and exits the BIOS Setup program.	<YES>	Save changes
Discard Changes and Exit	This exits the BIOS Setup without saving the changes made in BIOS Setup to the CMOS.	<YES>	Saves the changes
		<NO>	Return to the BIOS Setup Main Menu
Save Changes and Reset	Reset the system after saving the changes.	<YES>	Saves the changes
		<NO>	Return to the BIOS Setup Main Menu
Discard Changes and	Reset system setup without saving any changes	<YES>	Saves the changes

Reset		<NO>	Return to the BIOS Setup Main Menu
Save Changes	Save changes done so far to any of the setup options.	<YES>	Saves the changes
		<NO>	Return to the BIOS Setup Main Menu
Discard Changes	Discard changes done so far to any of the setup options.	<YES>	Saves the changes
		<NO>	Return to the BIOS Setup Main Menu
Restore Default	Restore/load default values for all the setup options.	<YES>	Saves the changes
		<NO>	Return to the BIOS Setup Main Menu
Save as User Defaults	Save the changes done so far as User defaults.	<YES>	Saves the changes
		<NO>	Return to the BIOS Setup Main Menu
Restore User Defaults	Restore the User Defaults to all the setup options.	<YES>	Saves the changes
		<NO>	Return to the BIOS Setup Main Menu

3.3 Using Recovery Wizard to Restore Computer

Bay Trail Intel® Celeron N2930 series computer has a dedicate recovery partition stored on the hard drive of the PC to enable quick one-key recovery process. This partition occupies about 11GB of the storage space, and comes built-in to each IB32 series PC.

IMPORTANT:
Before starting the recovery process, be sure to backup all user data, as all data will be lost after the recovery process.

Follow the procedure below to enable quick one-key recovery procedure:

- Plug-in the AC adapter to Bay Trail series computer. Make sure the computer stays plugged in to power source during the recovery process.
- Turn on the computer, and when the boot screen shows up, press the **F6** to initiate the Recovery Wizard.
- The following screen shows the Recovery Wizard. Click Recovery button to continue.

A warning message about data loss will show up. Make sure the data is backed up before recovery, and click Yes to continue.

Wait the recovery process to complete. During the recovery process, a command prompt will show up to indicate the percent of recovery process complete. The system will restart automatically after recovery completed.

CHAPTER 4

Driver Installation

This chapter offers information on all of the recommend driver installations.

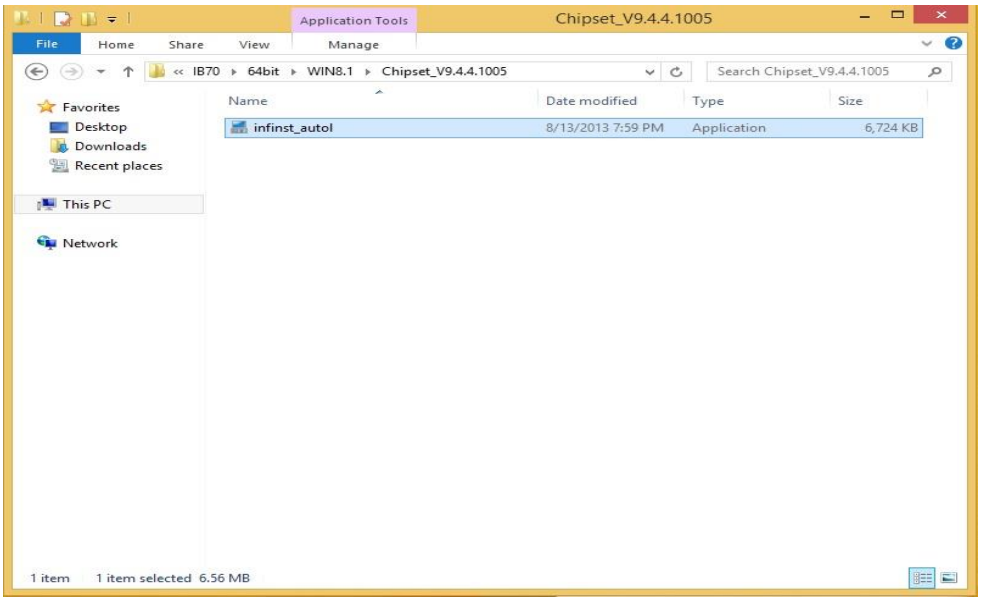
Sections include:

4.1 Intel Chipset Driver
4.2 Graphic Driver
4.3 Audio Driver
4.4 Intel Sideband Fabric Device (Intel MBI) (for Windows 8)
4.5 Intel Trusted Engine Interface (Intel TXE)
4.6 USB 3.0 Driver (for Windows 7)

Chapter 4 Driver Installation

4.1 Intel Chipset Driver

Step 1 Insert the CD that comes with the motherboard. Open the file document "Chipset Driver" and click on "infinst_auto.exe" to install the driver.



Step 2 Click "Next" to continue the installation.

Step 3 Click “Yes” to agree with the license terms.

Step 4 Click “Next” to continue.

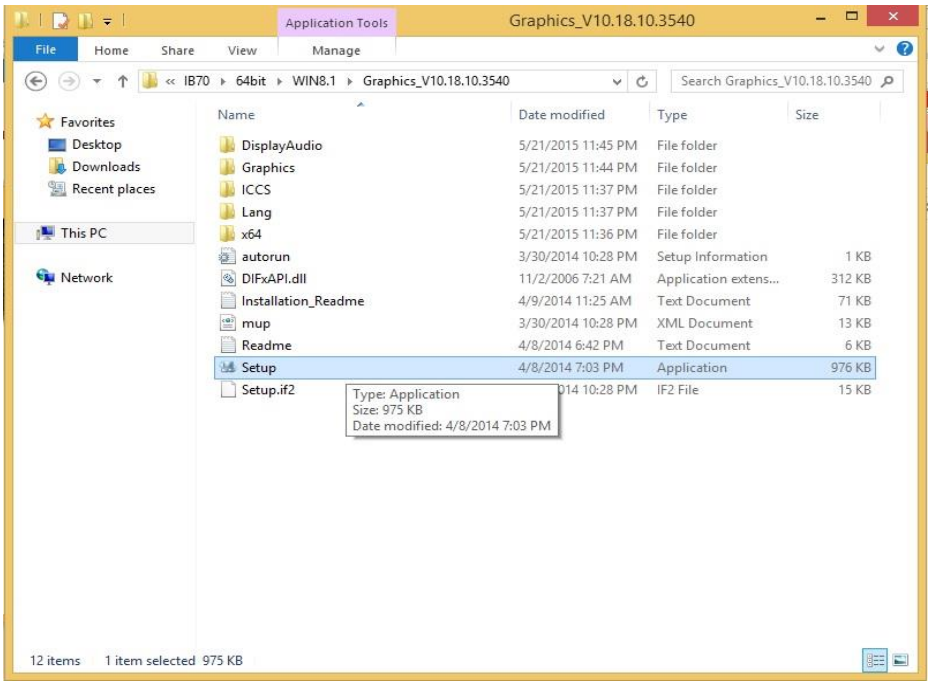
Step 5 Please wait for the following operations to be performed.

Step 6 Click “Next” to continue.

Step 7 Select “Yes, I want to restart this computer now”, and click “Next” to finish the installation.

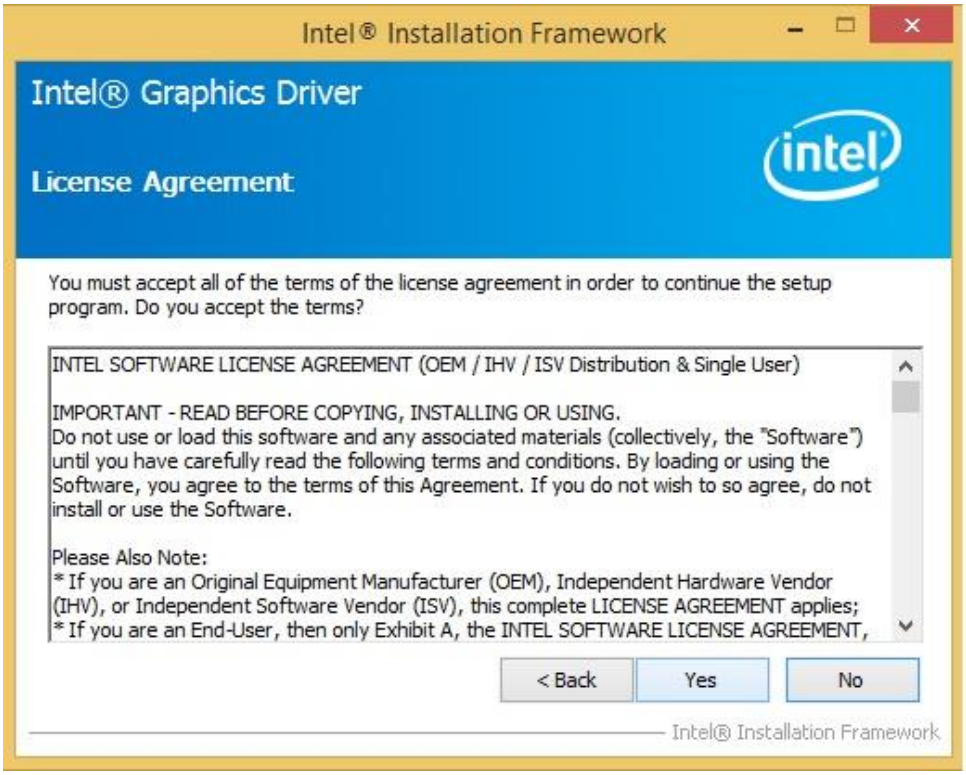
4.2 Graphics Driver

Step 1 Insert the CD that comes with the motherboard. Open the file document "Graphics Driver" and click "Setup.exe" to install the driver.

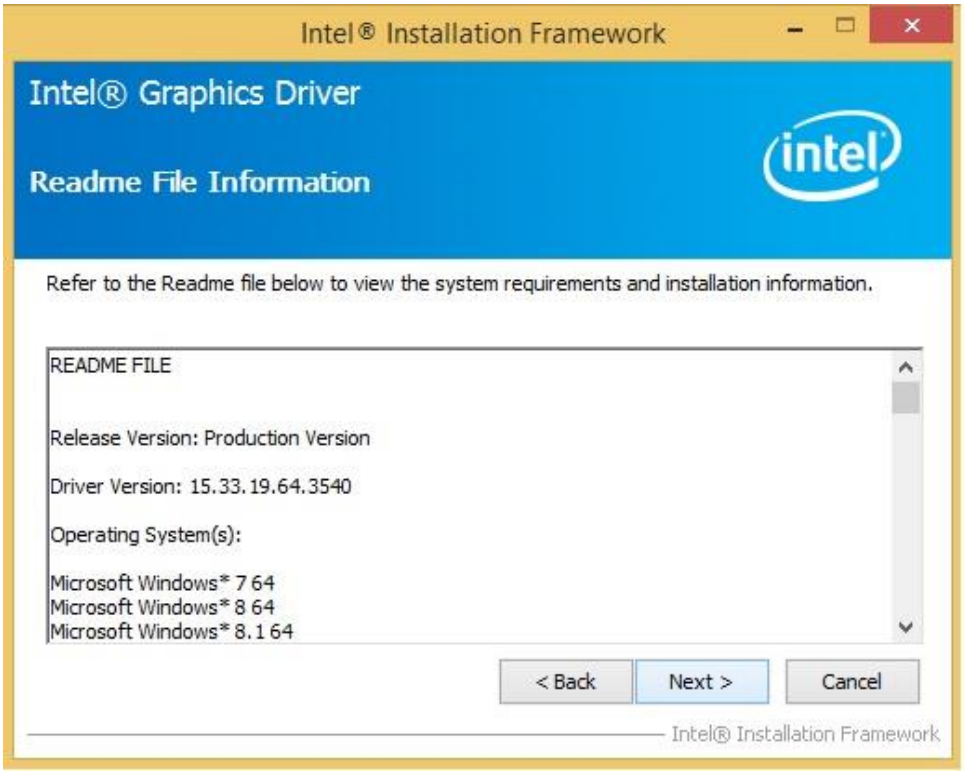


Step 2 Click "Next" to continue the installation.

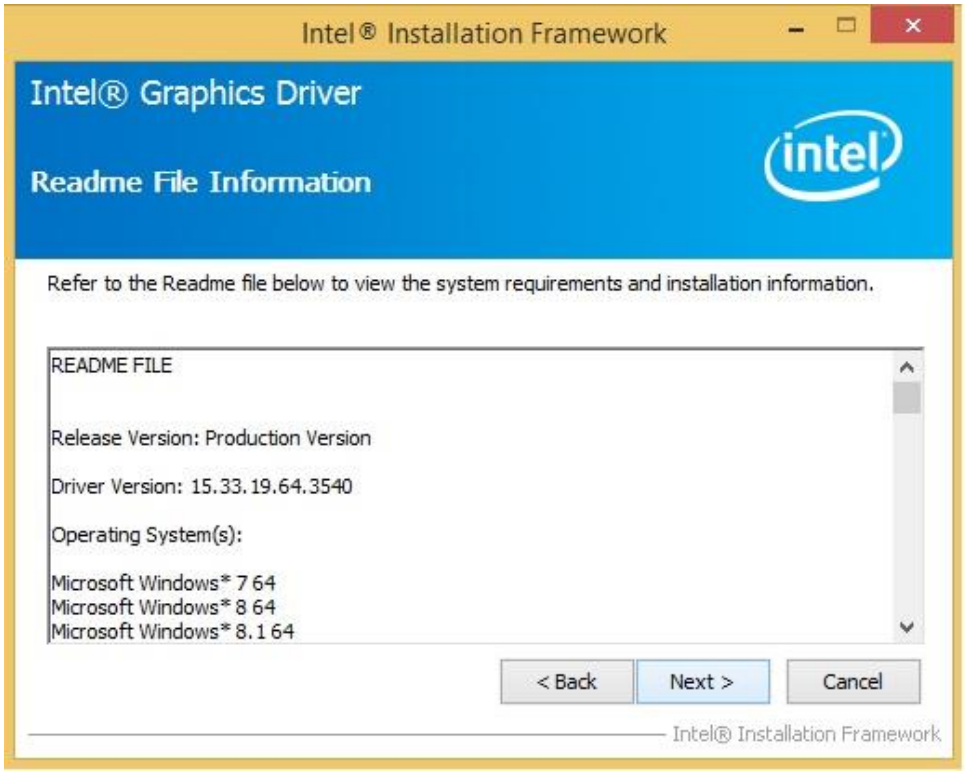
Step 3 Click “Yes” to agree with the license terms.



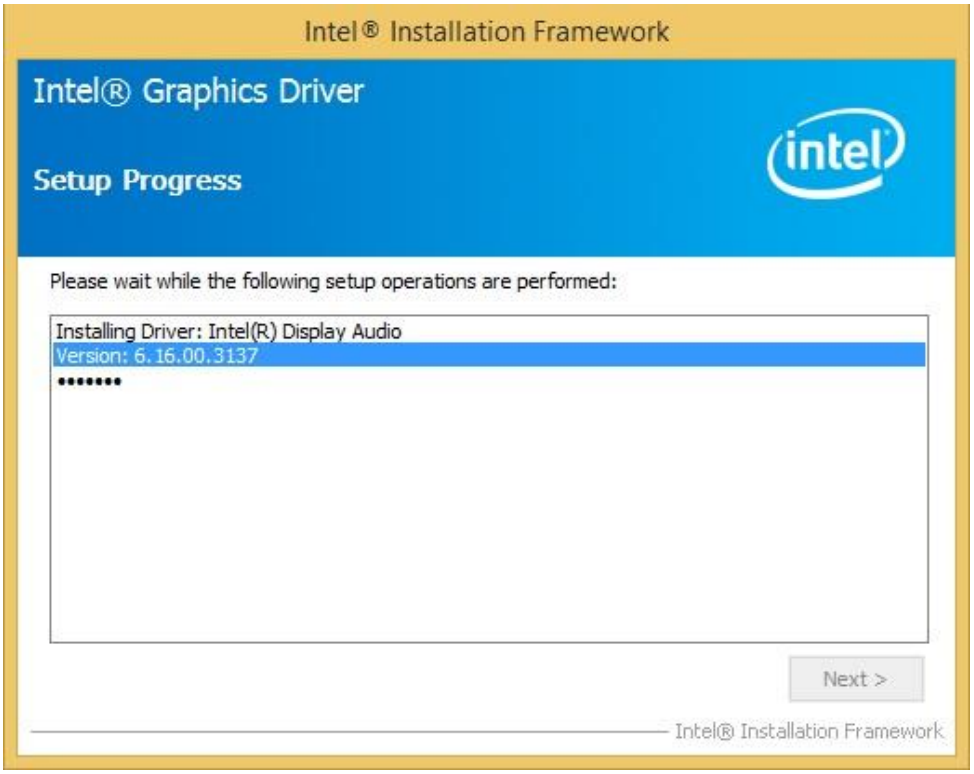
Step 4 Click “Next” to continue the installation.



Step 5 Click “Next” to continue the installation.

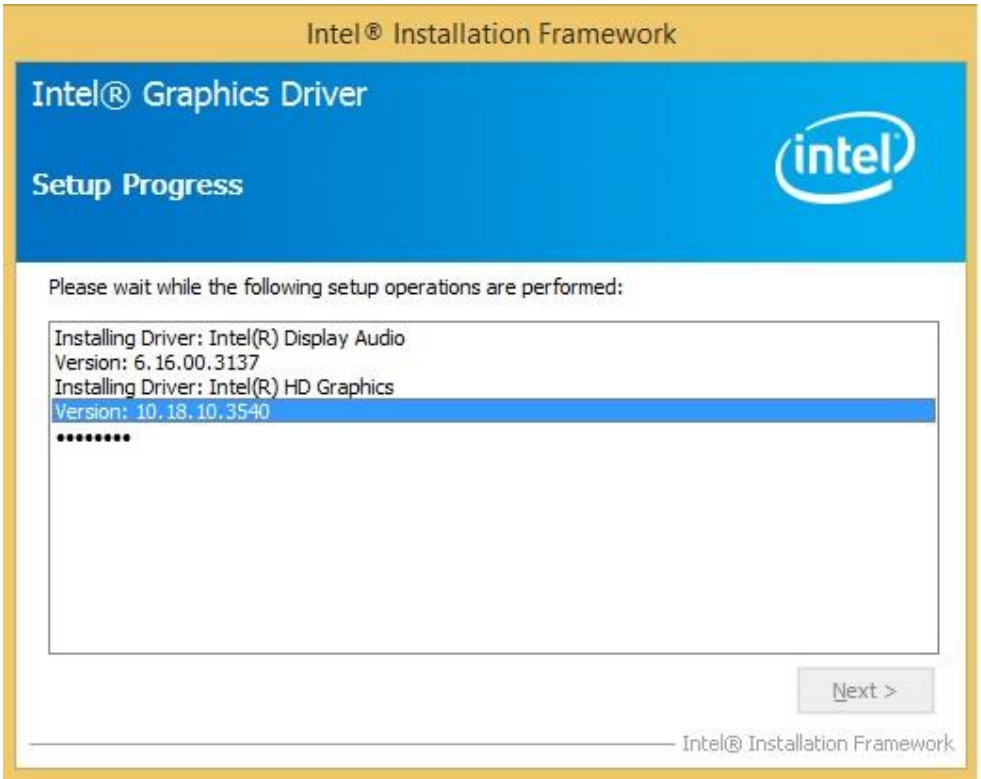


Step 6 Click “Next” to continue the installation.

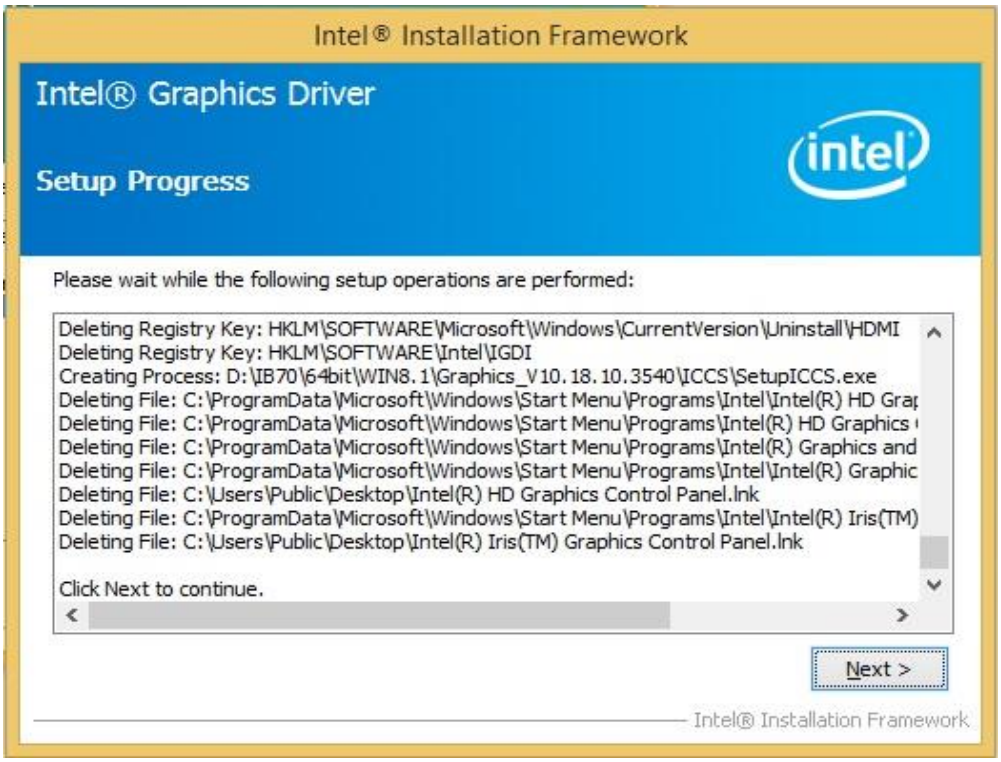


Windows Security warning message will appear on the screen, click “Install this driver software anyway” to continue the installation.

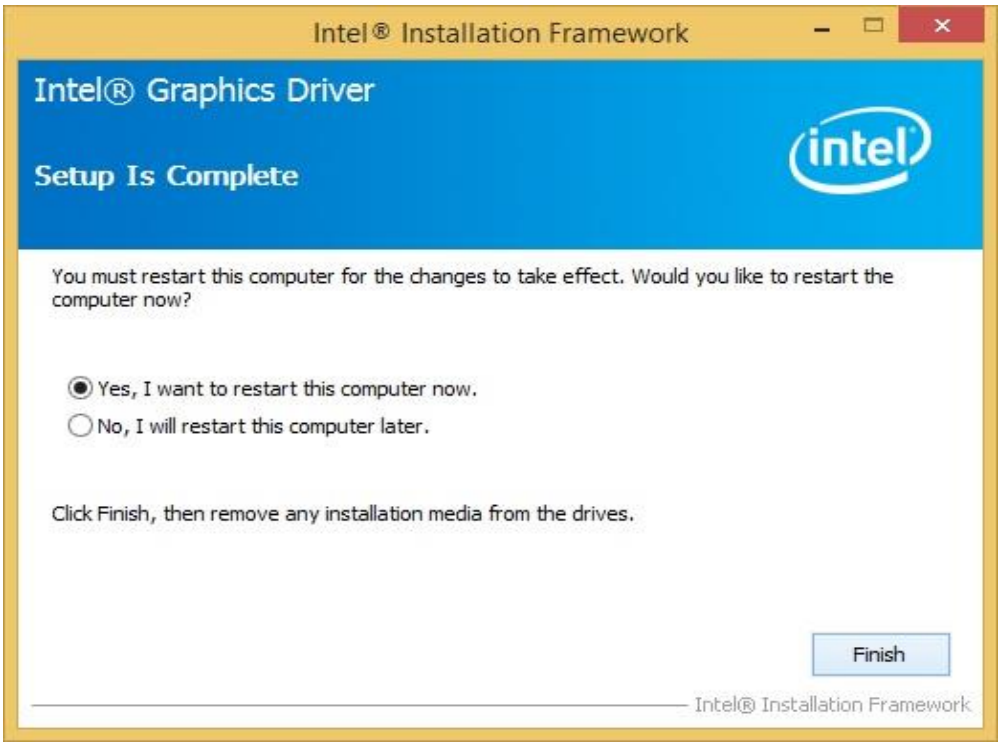
Step 7 Please wait for the following operations to be performed.



Step 8 Click “Next” to continue the installation.

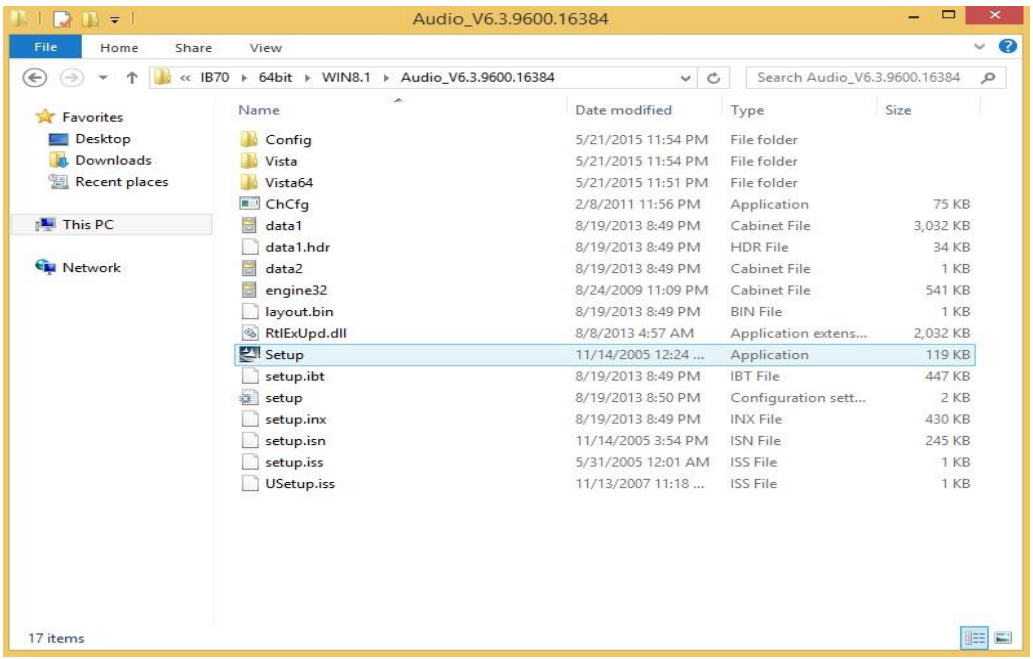


Step 9 Click “Yes, I want to restart this computer now” to finish the installation and restart the computer.

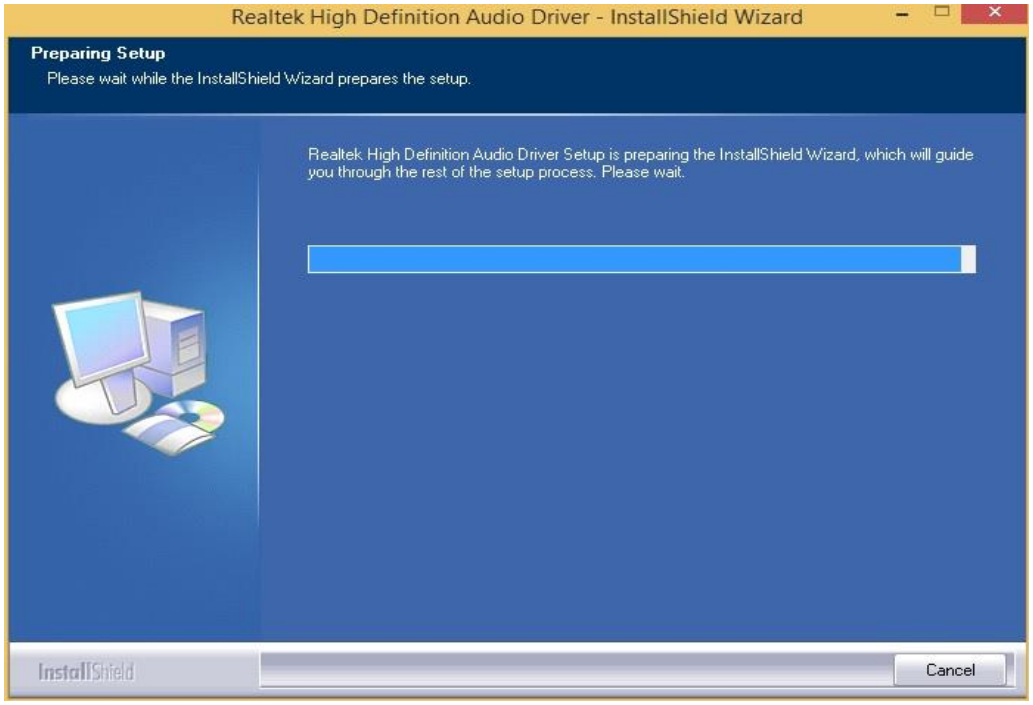


4.3 Audio Driver

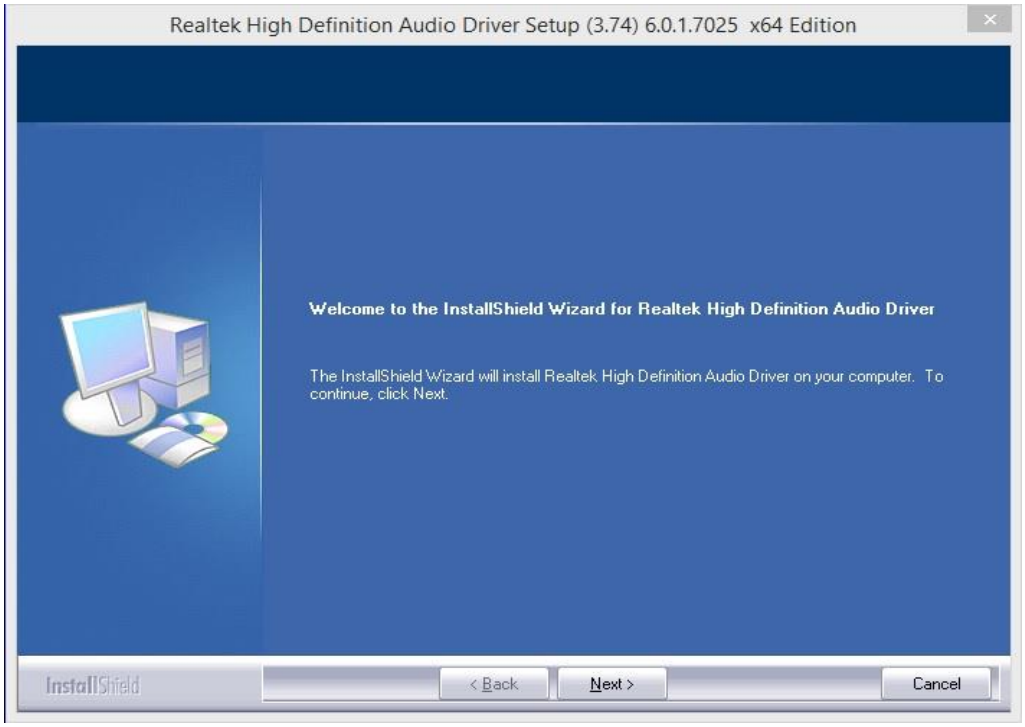
Step 1 Insert the CD that comes with the motherboard. Open the file document "Audio Driver" and click on "Setup.exe" to install the driver.



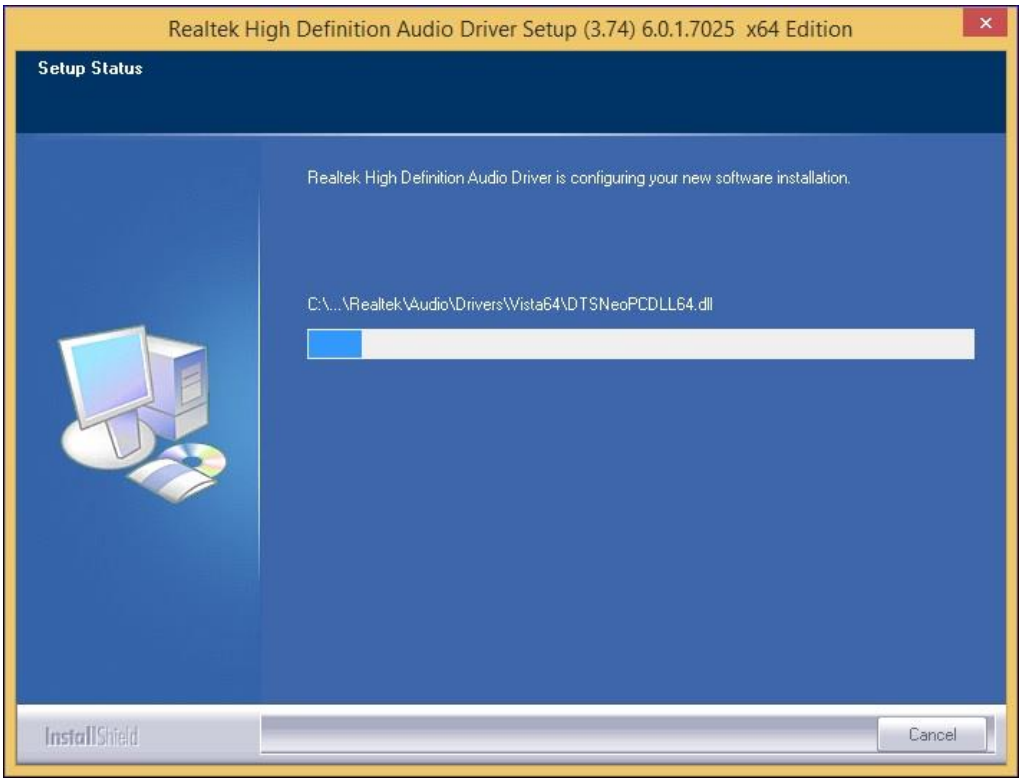
Step 2 Wait while setup is preparing the installation.



Step 3 Click “Next” to continue the installation.

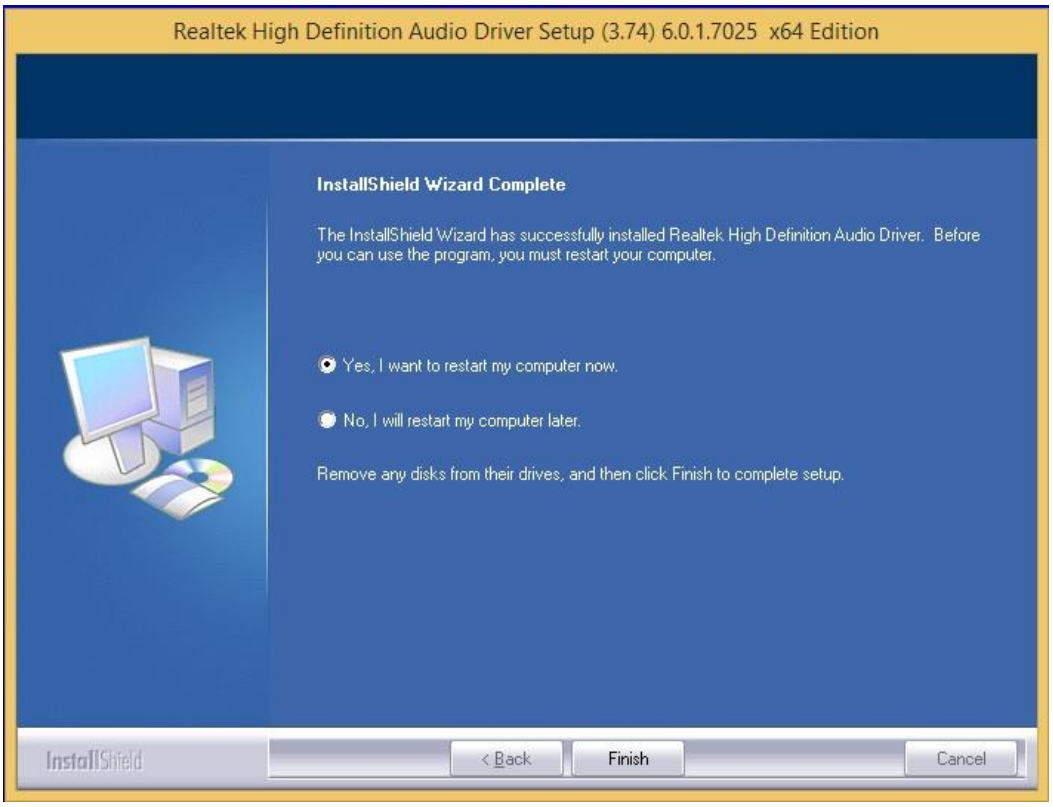


Step 4 Please wait for the driver to configure your new software installation.



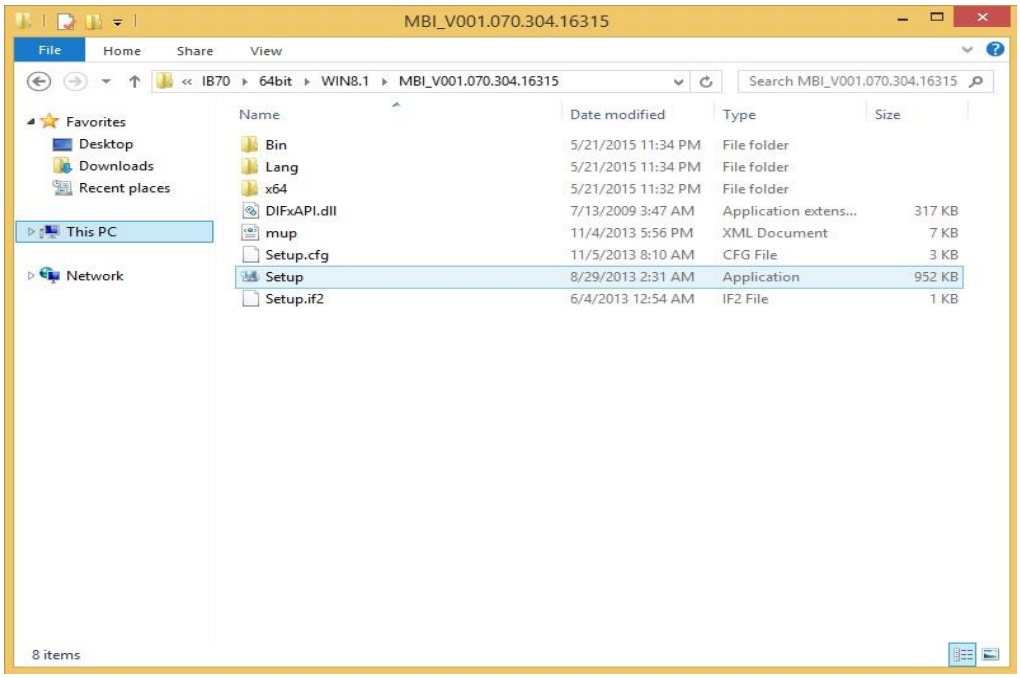
Step 5 Windows security warning message will pop-up, mark “Always trust software from “Realtek Semiconductor Corp” and click “Install”.

Step 6 Select “Yes, I want to restart my computer now”, and then press finish to complete the installation.

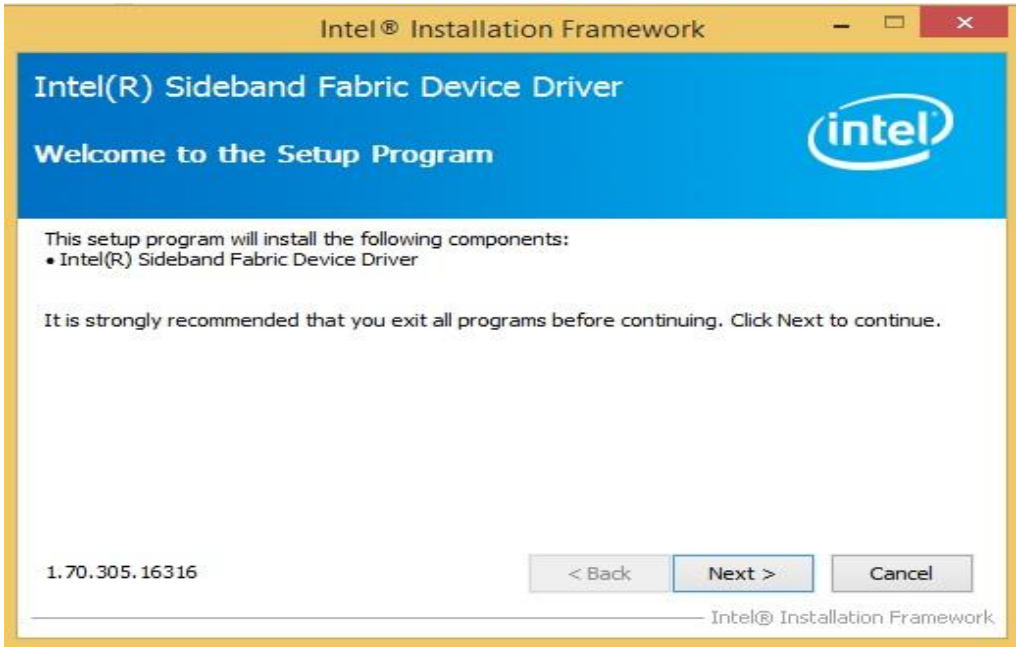


4.4 Intel Sideband Fabric Device (Intel MBI) Driver (Windows 8)

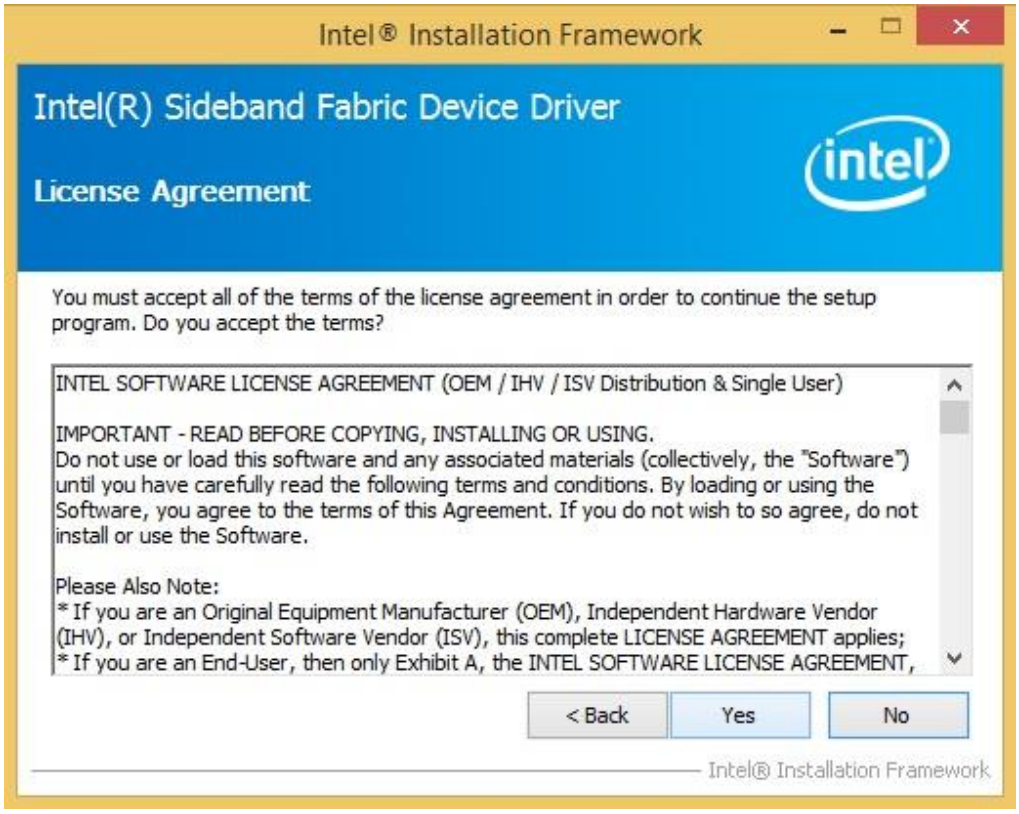
Step 1 Insert the CD that comes with the motherboard. Open the file document "MBI" and click on "Setup.exe" to install the driver.



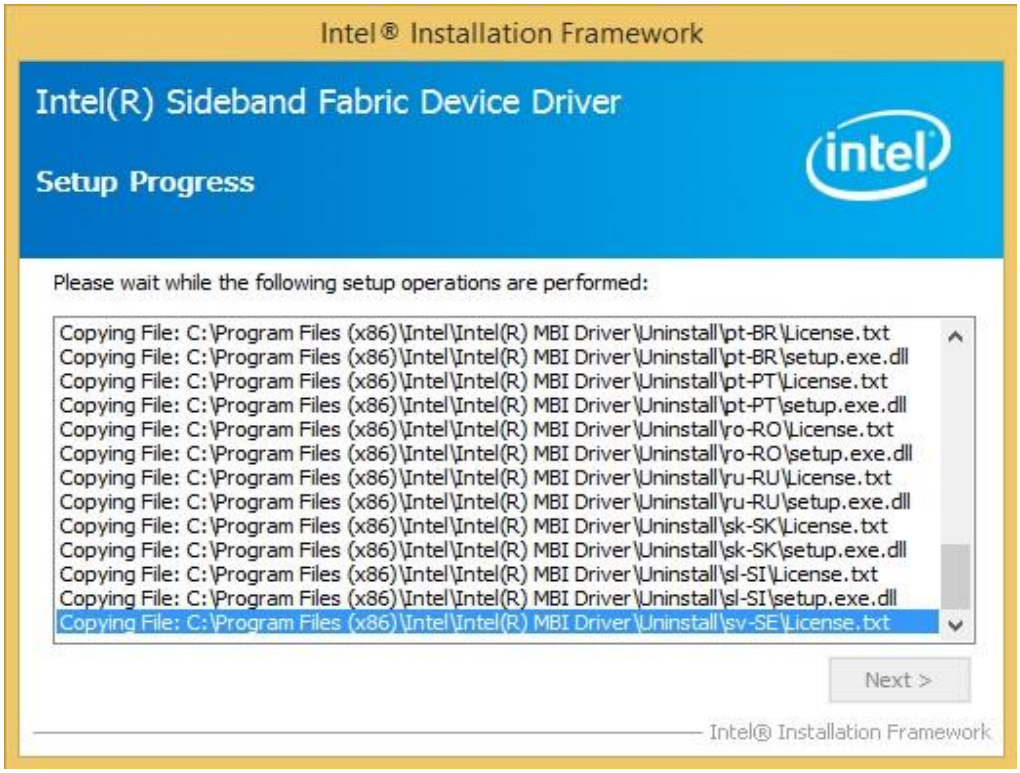
Step 2 Click "Next" to continue the driver installation.



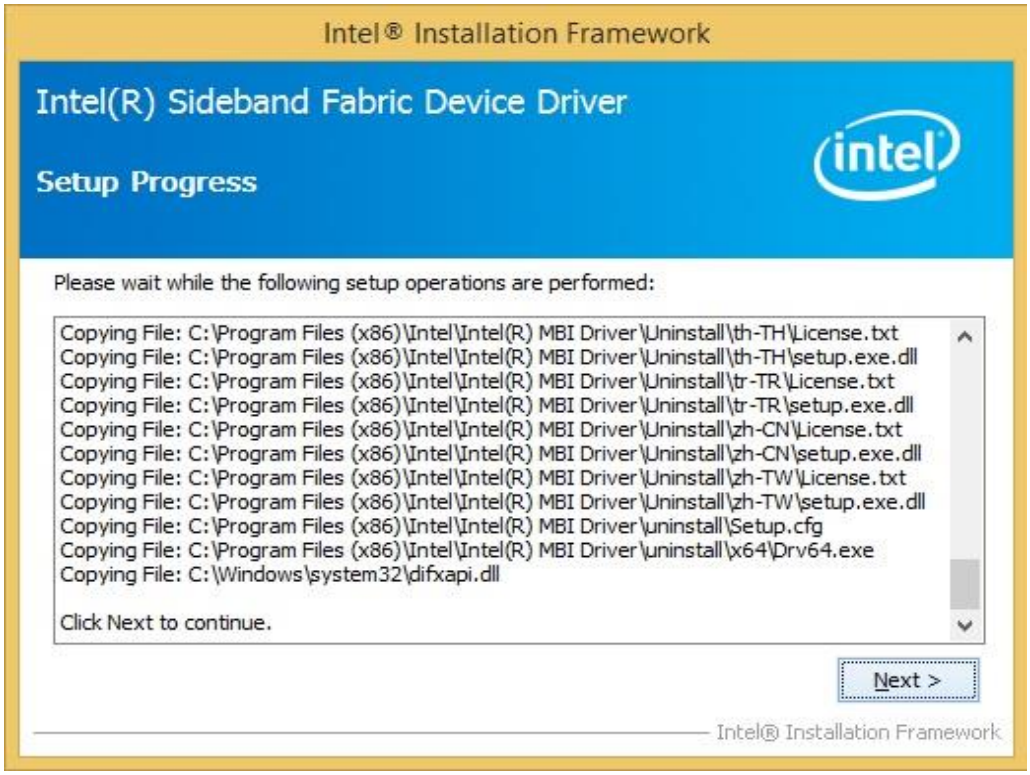
Step 3 Click “Yes” to agree with the license terms.



Step 4 Please wait while the following setup operations are performed.



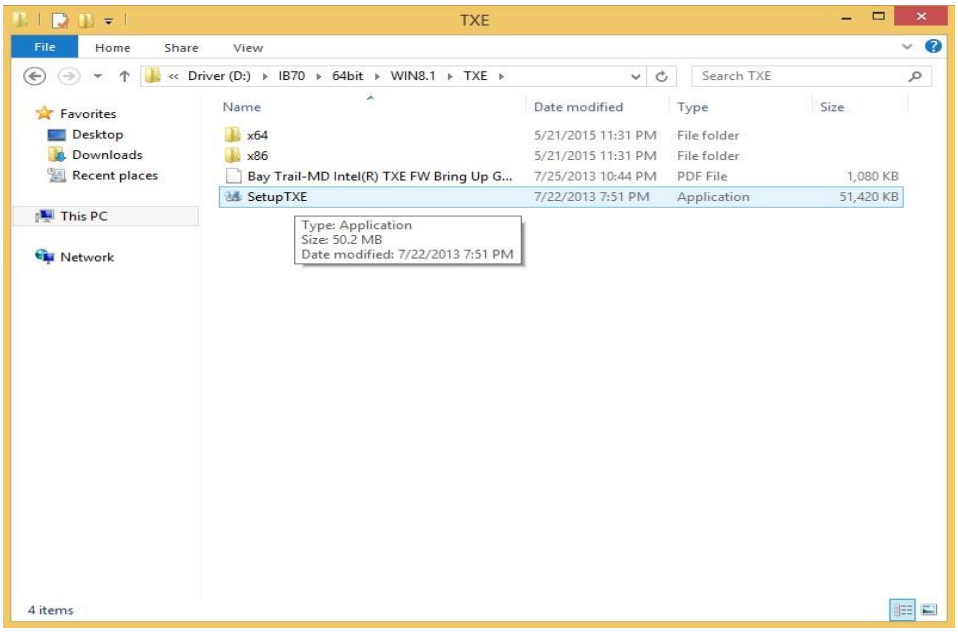
Step 5 It may take some time for the following setup operations to be performed.



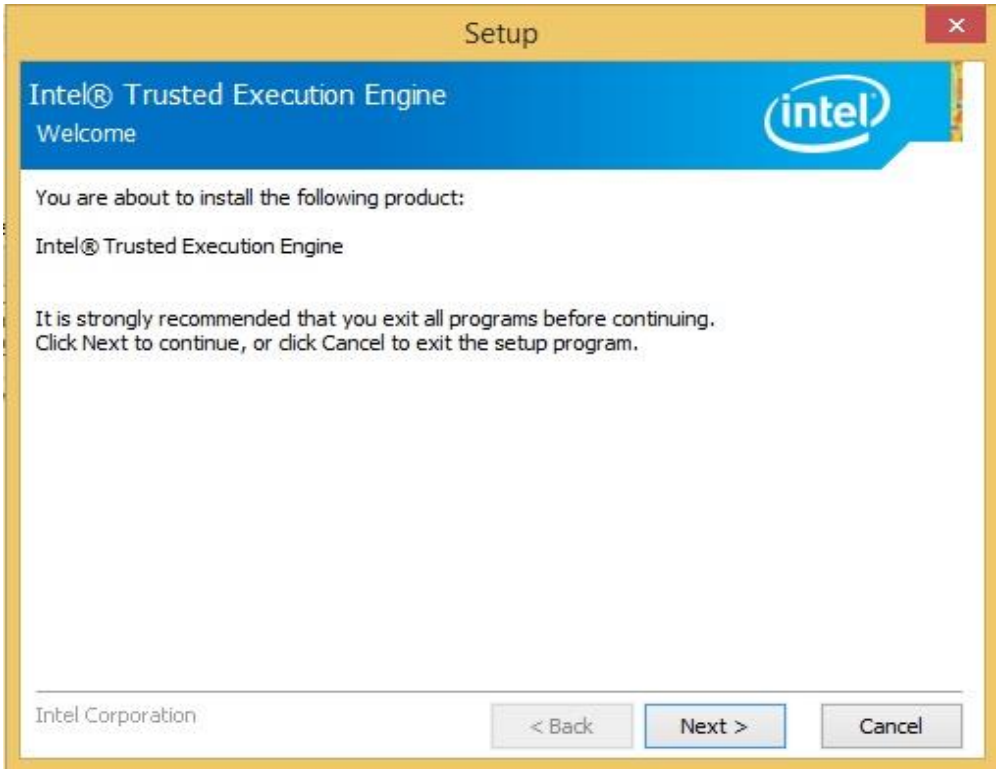
Step 6 Select “Yes, I want to restart this computer now”, and then click Finish to complete the installation.

4.5 Intel Trusted Engine Interface (Intel TXE) Driver Installation

Step 1 Insert the CD that comes with the motherboard. Open the file document "TXE" and click on "Setup TXE.exe" to install driver.

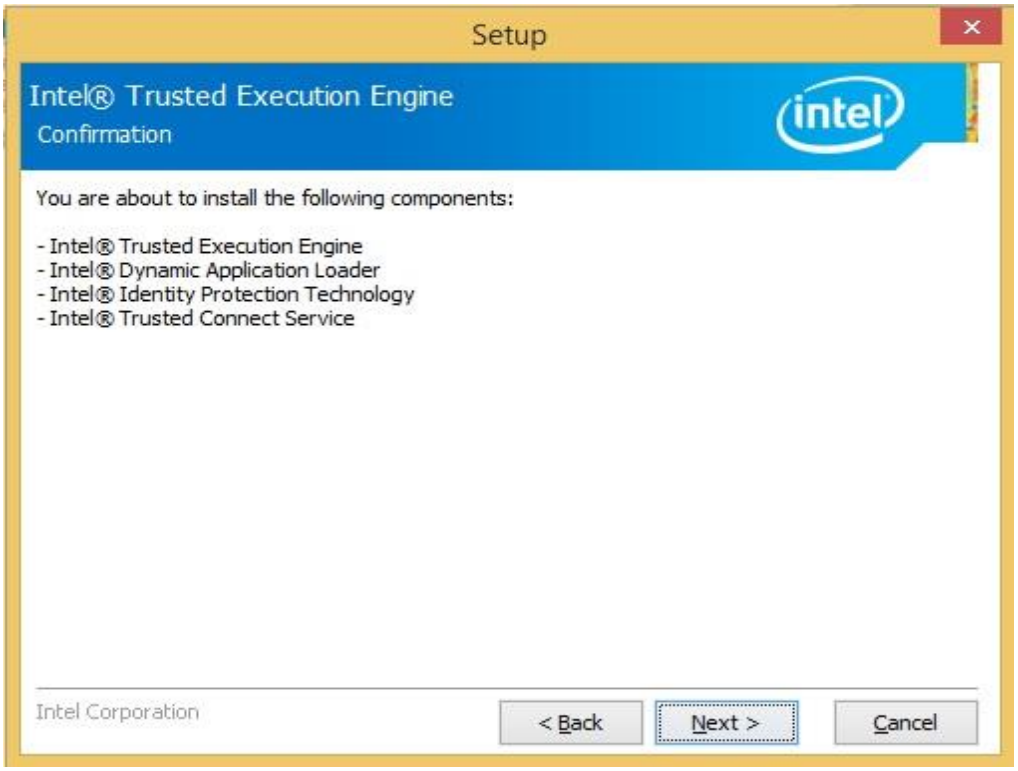


Step 2 Click "Next" to continue the installation.

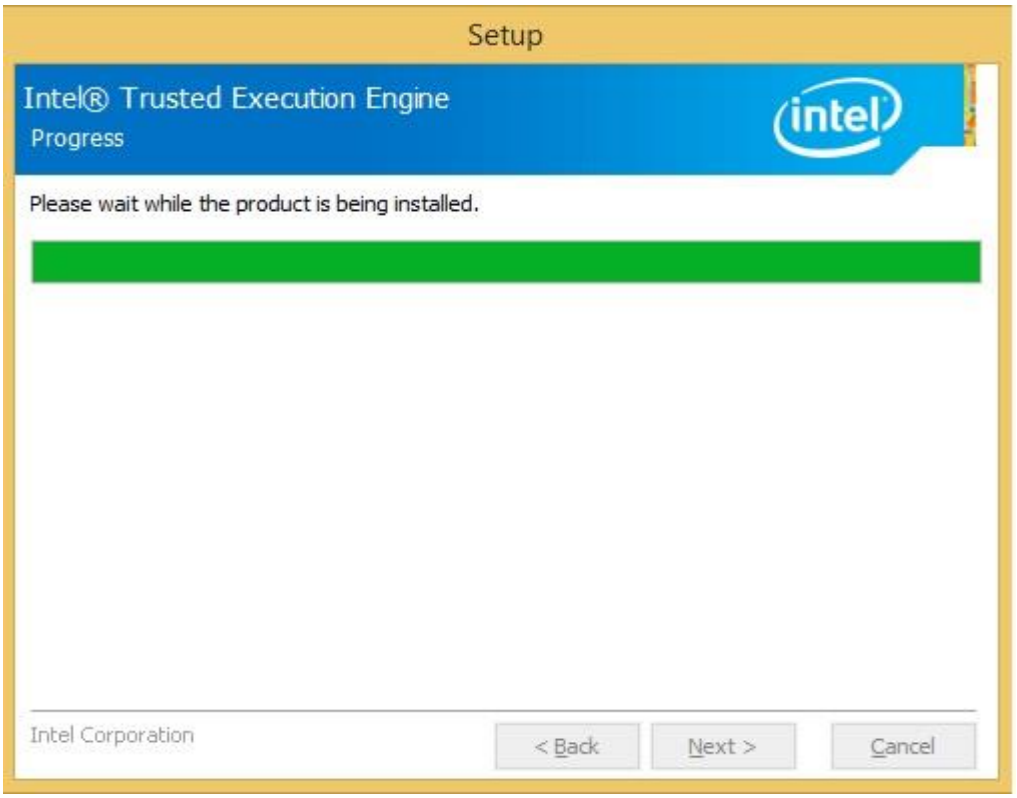


Step 3 Click “Next” to agree with the license terms.

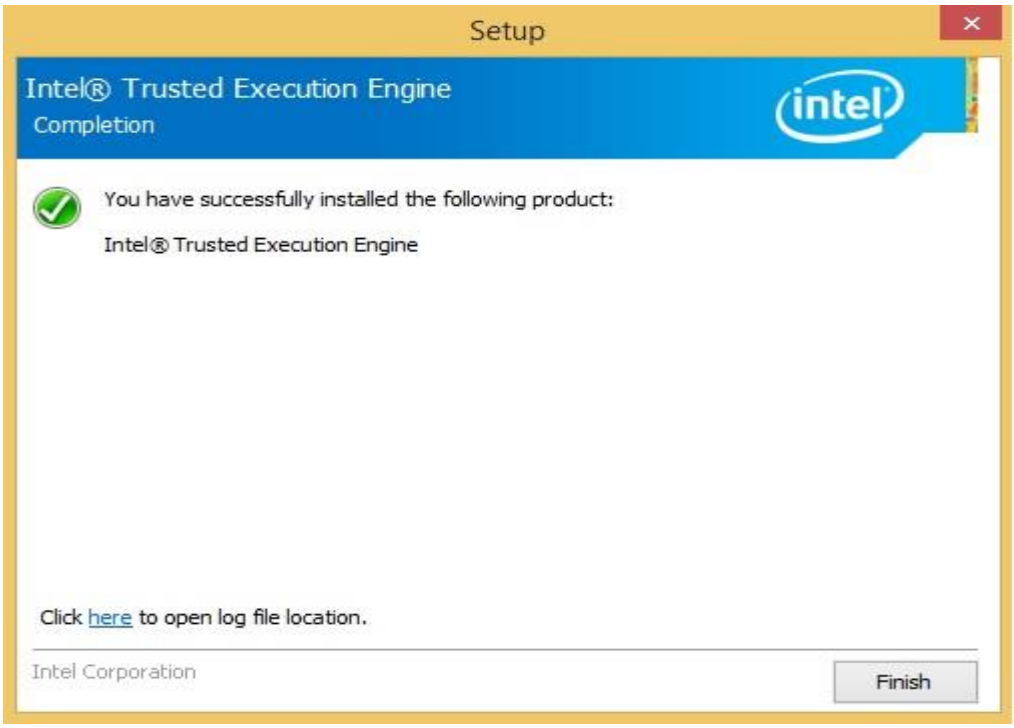
Step 4 Click “Next” to continue the installation.



Step 5 Please wait while the product is being installed.



Step 6 Click “Finish” to complete the installation.

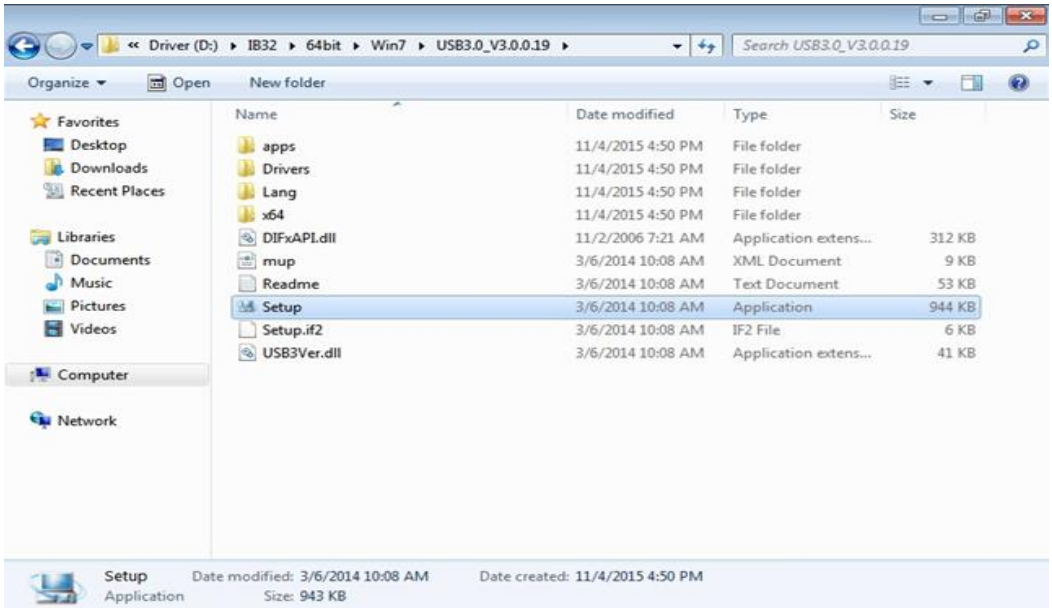


4.6 USB 3.0 Driver (Windows 7)

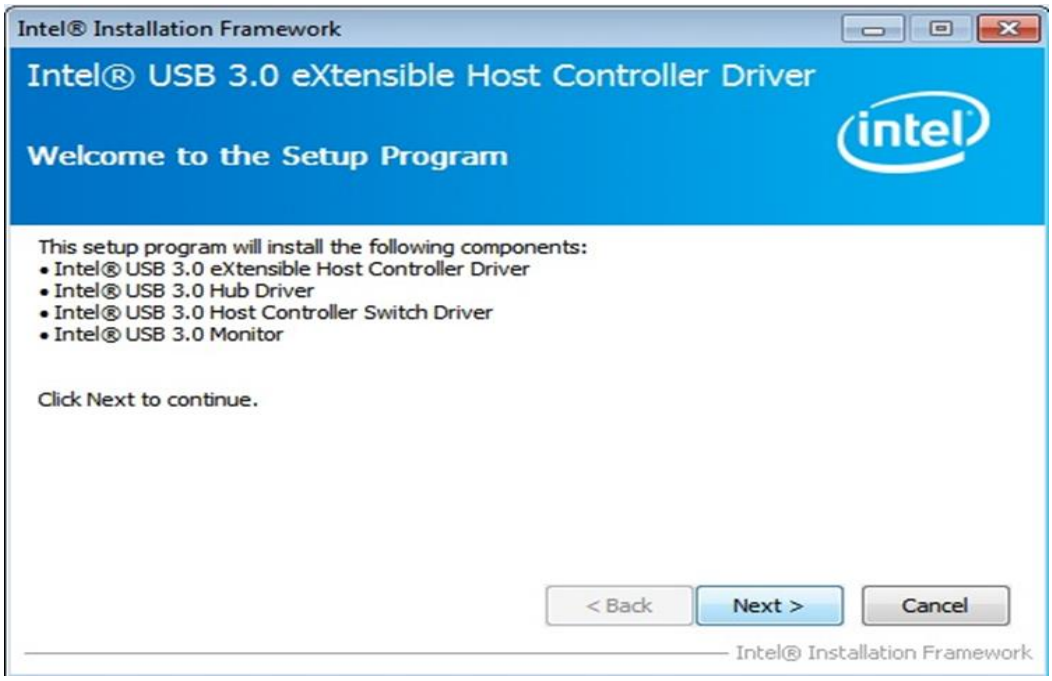
NOTE:
If the operating system of the device is Windows Embedded 8.1 Industry or Windows Embedded 8 Standard, users can skip this installation.

Step 1 Locate the hard drive directory where the driver files are stored with the browser or the explore feature of Windows*.

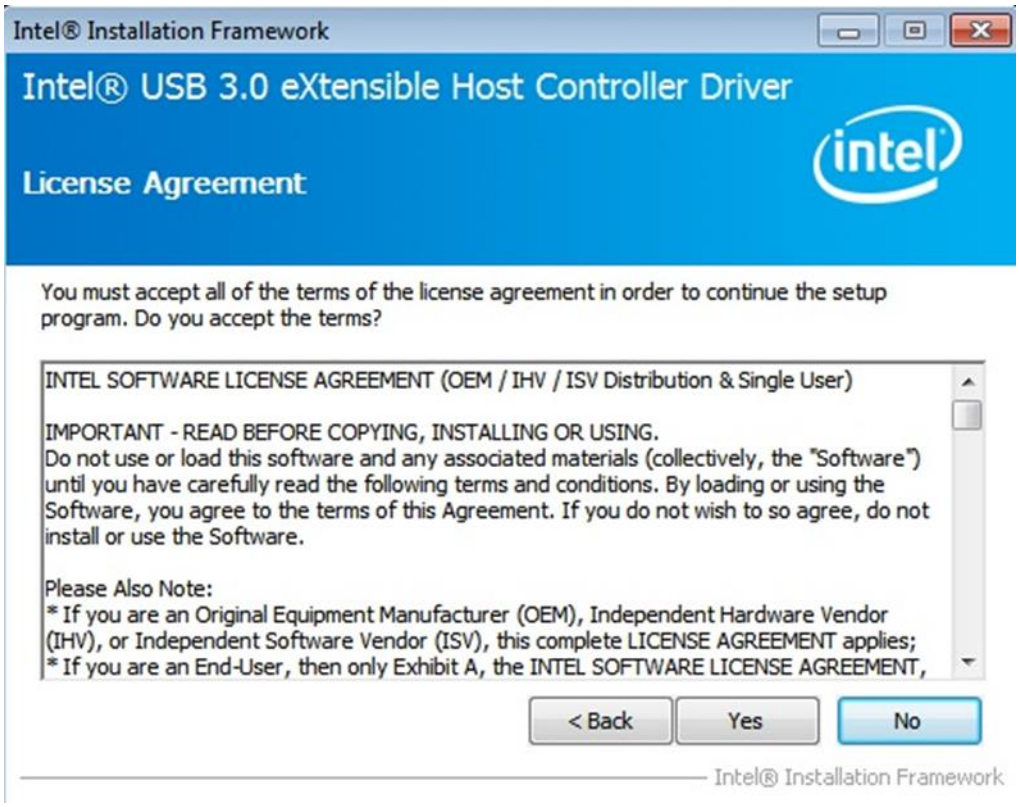
Step 2 Double click the “Setup.exe” from this directory.



Step 3 Click “Next” to continue

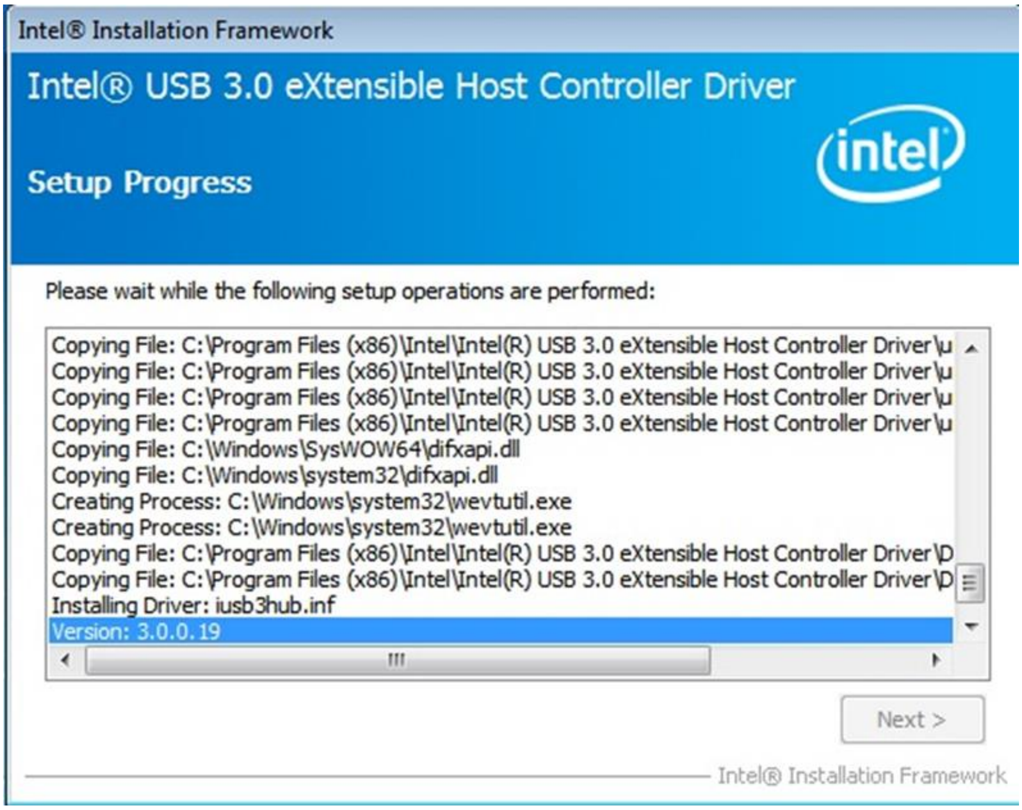


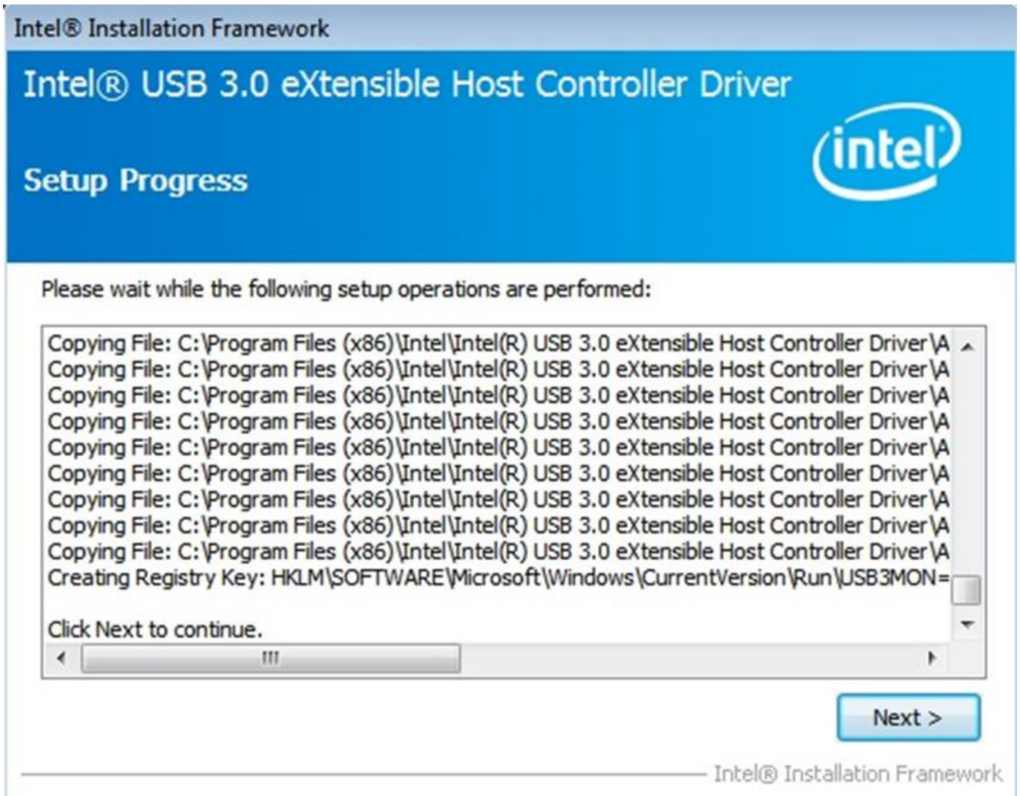
Step 4 Read the License Agreement and click “Yes” to proceed.



Step 5 Review Readme File Information and click “Next” to proceed.

Step 6 When the Setup Progress is complete click "Next" to proceed.





Step 7 Click “Yes, I want to restart this computer now” to finish and then restart your computer.

CHAPTER 5

Technical Support Documents

This chapter includes appendix items for this user manual and SDK.

5.1 Digital I/O SDK

5.2 Watchdog SDK

Chapter 5: Technical Support Documents

SDK List

You can download SDK from our download center, please click the link below.
https://www.dropbox.com/s/l3lklrmiqy2lip6/SDK.rar?dl=0

5.1 Digital I/O SDK

To find the Digital I/O Sample code, please refer to the IB32 driver CD SDK or contact us.

5.2 Watchdog SDK

To find the Watchdog Sample code, please refer to the IB32 driver CD SDK or contact us.