ACS-2645 Box PC
User Manual

Release Date	Revision
Aug, 2014	V1.2

Aplex Technology, Inc.
15F-1, No.186, Jian Yi Road, Zhonghe District, New Taipei City 235, Taiwan
Tel: 886-2-82262881 Fax: 886-2-82262883 E-mail: aplex@aplex.com.tw URL: www.aplex.com.tw

Warning!

This equipment generates, uses and can radiate radio frequency energy and if not installed and used in accordance with the instructions manual, it may cause interference to radio communications.
It has been tested and found to comply with the limits for a Class A computing device pursuant to FCC Rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference in which case the user at his own expense will be required to take whatever measures may be required to correct the interference.

Electric Shock Hazard – Do not operate the machine with its back cover removed. There are dangerous high voltages inside.

Packing List

Accessories (as ticked) included in this package are:
☐ AC power cable ☐ Driver & manual CD disc ☐ Other._____(please specify)

Safety Precautions

Follow the messages below to avoid your systems from damage:

- ◆ Avoid your system from static electricity on all occasions.
- ◆ Prevent electric shock. Don‘t touch any components of this card when the card is power-on. Always disconnect power when the system is not in use.
- ◆ Disconnect power when you change any hardware devices. For instance, when you connect a jumper or install any cards, a surge of power may damage the electronic components or the whole system.

Table of Contents

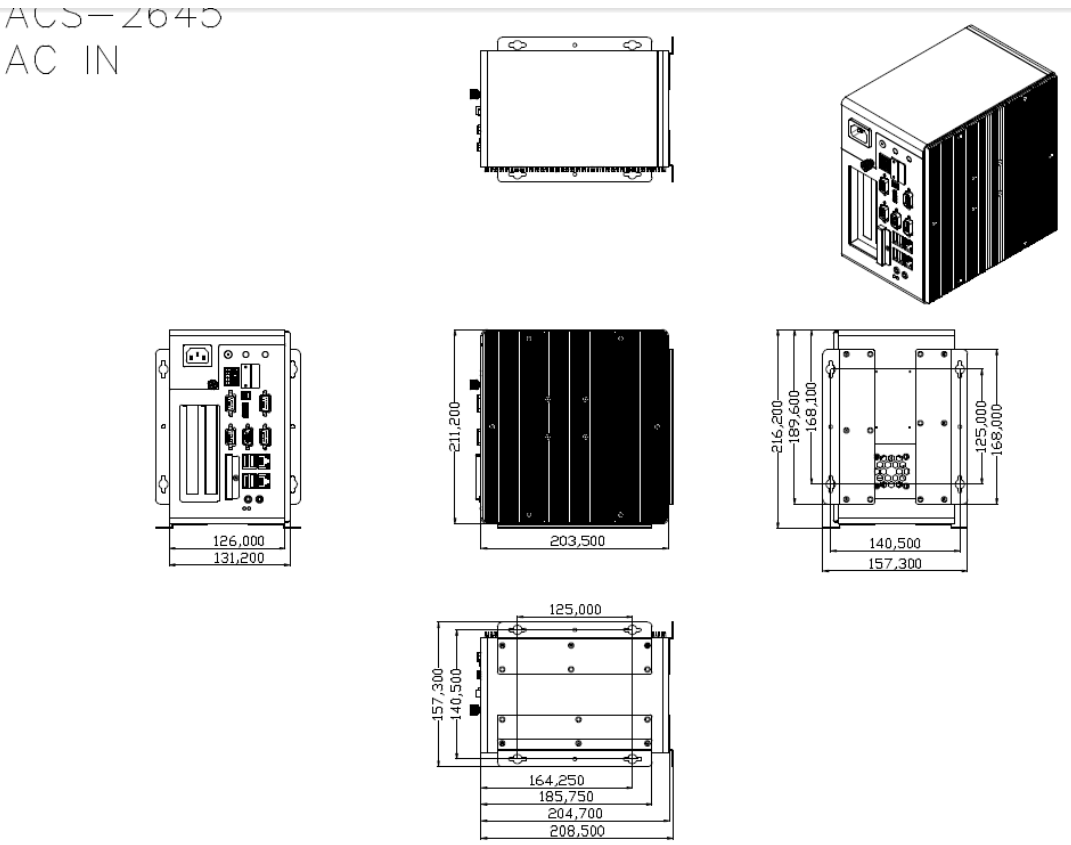
Figures

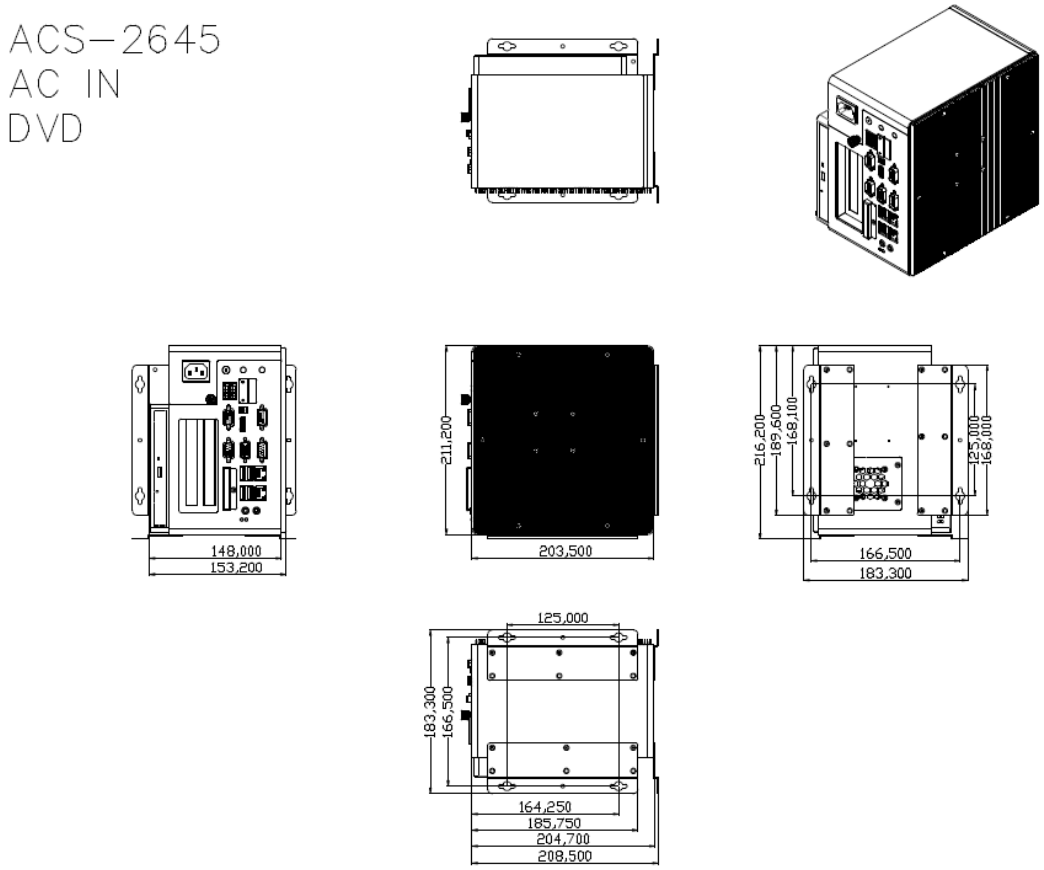
Chapter 1 Getting Started

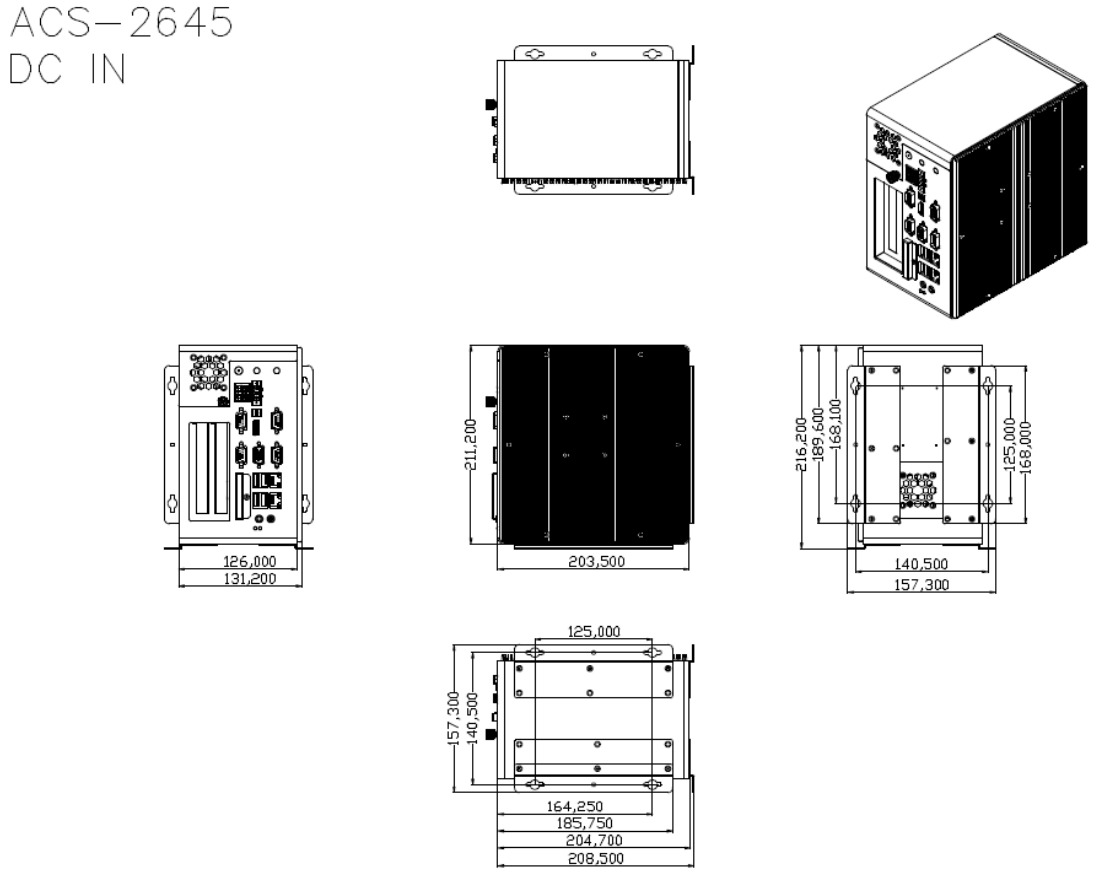
1.1 Specifications

Specs	ACS-2645
CPU	Intel Atom Processor D2550 1.86GHz , L2 Cache 1MB
System Chipset	Intel NM10 Express
System Memory	Support 2 x SO-DIMM 204pin, up to 4GB DDRIII 800/1066MHz FSB
External I/O Port	Rear I/O Side 1 x RS-232 (COM1) 1 x RS-232 (COM2) 1 x DB15 VGA 4 x USB 2.0 Ports 2 x Ethernet RJ45 LAN Port 1 x 9~32V DC Power input 1 x Audio Ports (MIC-in, Line out) 1 x 2 Pin Power Switch (terminal block) 2 x LED Indication (Power/HDD) 1 x HDMI 1 x Power button switch 1 x CF Slot by USB 1 x COM RS-422/485 (COM3, default:RS-485) 1 x COM RS-232 (COM4) 1 x 10 pins terminal block for 1 Ground/VCC/ 4 in & out DIDO
Expansion Slots	Default: 1 x PCI and PCIe x1 slots Option: 2 x PCI slots
Storage	Default 2 x 2.5” SATA HDD space 1 x External CF slot
Power Supply	On board DC 9~32V / AC power input
Construction / Color	Black Steel and Aluminum Heatsink as ACS-2695
Mounting	Default: Wall mount / Option: Din Rail mount (single or dual)
Dimensions(WxHxD)	211.2(W) x 203.5(H) x 131.2(D) 211.2(W) x 203.5(H) x 157.3(D) (with DVD Device)
Gross Weight	5kgs
Operating Temperature	0~50 ˚C
Storage Temperature	-20~60 °C
Storage Humidity	10%~90%@ 40°C, non-condensing
Certificate	CE / FCC Class A

1.2 Dimensions







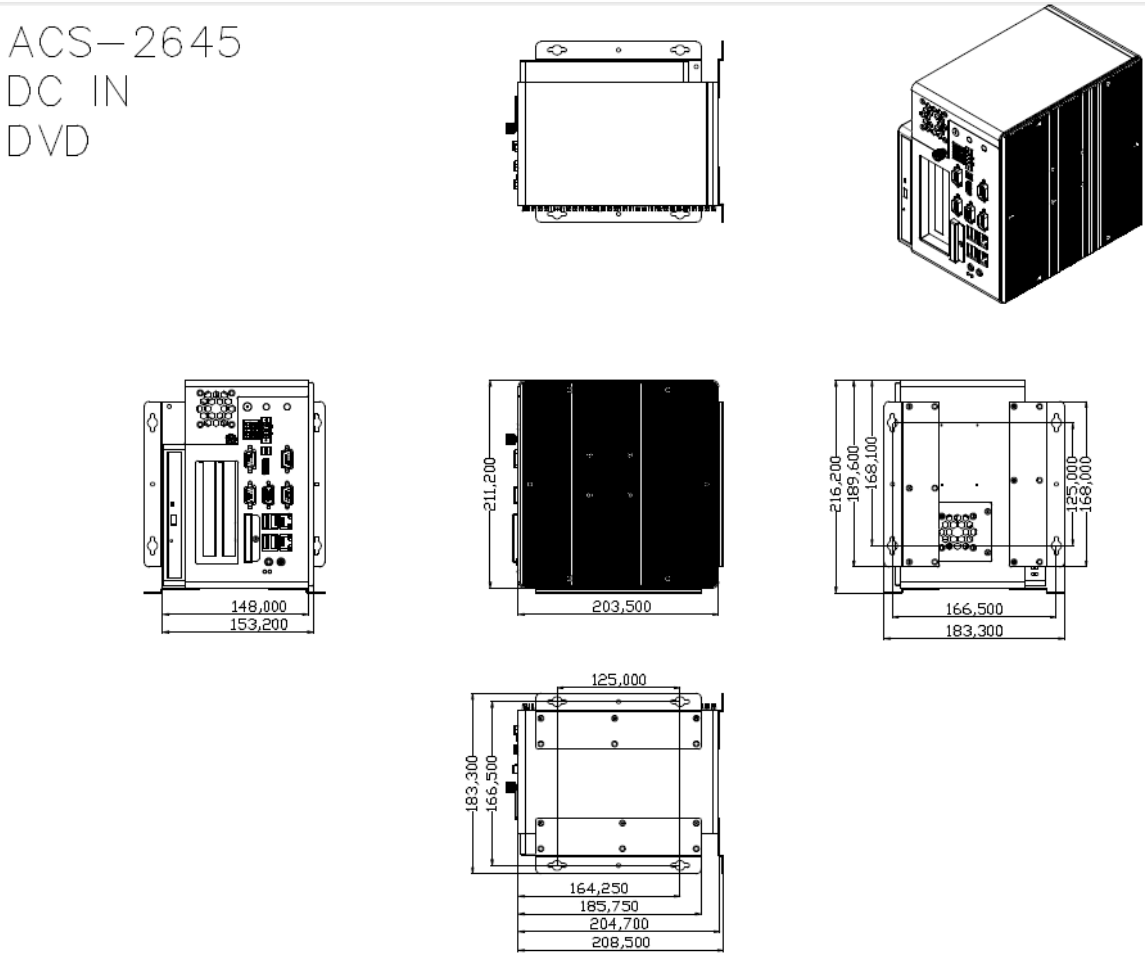


Figure 1.1: Dimensions of ACS-2645

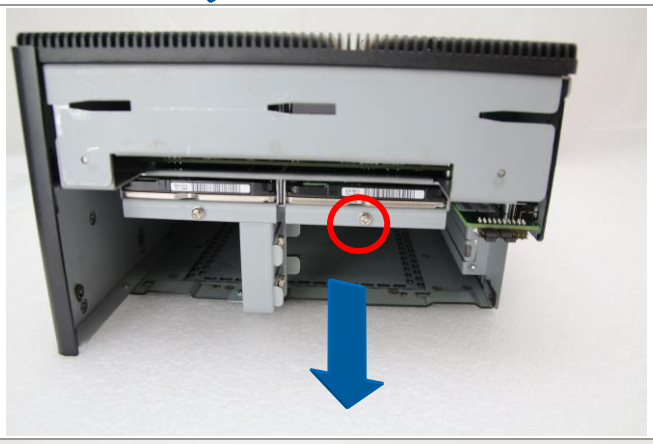
1.3 Brief Description of ACS-2645

ACS-2645 is a fan design High-efficiency Thermal Solution Box PC, powered by Intel Atom Processor D2550 1.86GHz and supporting 2 x SO-DIMM 204pin, up to 4GB DDRIII 800/1066MHz FSB, 4 x USB connector, 4 x COM Ports, support 2 x SATA HDD space, 1 x external CF slot, 1 x PCI and 1 x PCIe x 16 slot expansion, DC Power 9~32V input etc. It is ideal for Industrial Automation, Factory Automation, Machine Vision, Process Control, Data Terminal, TI, Surveillance, etc. and running factory operations from small visual interface and maintenance applications to large control process applications. ACS-2645 works very well along with any of our Display series and it absolutely can provide an easy way to perform control and field maintenance.

Figure 1.2: Front View of ACS-2645

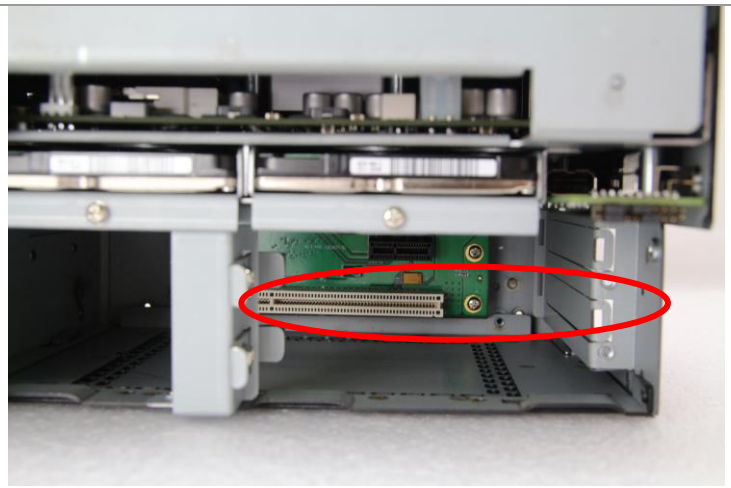
Figure 1.3: Rear View of ACS-2645

1.4 Installation of HDD

Step 1 There is one screw which connects to the chassis. Pull out the chassis towards the I/O side after unscrewing as shown in the picture.	
Step 2 There is 1 screw to deal with when enclosing or removing the HDD bracket .	
Loosen screws and draw the HDD bracket out.	
Loosen 4 screws	

Then you can replace HDD.	
Step 3 Tighten the 1 screw as shown in the picture. That's how it should look after it has been installed.	

1.5 Installation of PCI Add-on

Step 1 There is one screw which connects to the chassis. Pull out the chassis towards the I/O side after unscrewing as shown in the reference picture.	
Step 2 Now slide the add on into the PCI slot, making sure the golden part faces the slot. When the part that is interfaced together come into the right contact, slightly push the add on into the rail of the slot. After sliding the add on into the PCI expansion slot, get the one screw as circled tightened to finish the connection. ** Half Expansion-card limit to be not more than 175mm length	
Step 3 Tighten the 1 screw as shown in the picture. That's how it should look after it has been installed.	

Chapter 2 Hardware Installation

2.1 Mainboard specifications

Introduction

ASB-M7101 is a Mini-ITX industrial motherboard developed on the basis of Intel D2550 and NM10, which provides abundant peripheral interfaces to meet the needs of different customers. Also, it features dual 1000M LAN port, 6-COM port and one Mini PCIE configuration. To satisfy the special needs of high-end customers, PC104+ socket (capable of adjusting IO voltage) richer extension functions. The product is widely used in various sectors of industrial control.

Specifications

Specifications	
Board Size	170mm x 170mm
CPU Support	Intel Atom D2550 /1.86GHz (2cores,10W, onboard) Intel Atom N2800 /1.86GHz (2cores,6.5W, option） Intel Atom N2600 /1.60GHz (2cores,3.5W, option）
Chipset	Intel NM10 Express
Memory Support	2 x SO-DIMM (204pins) D2550：up to 4GB DDRIII 800/1066MHz FSB N2800：up to 4GB DDRIII 1066MHz FSB N2600：up to 2GB DDRIII 800MHz FSB
Graphics	Integrated Intel GMA 3650 (D2550/N2800) Integrated Intel GMA 3600 (N2600)
Display Mode	1 x CRT Port (VGA or VGA_PH) 1 x HDMI Port 1 x LVDS1 (18/24-bit single LVDS, option) 1 x LVDS2 (24-bit dual LVDS, option)
Support Resolution	Up to 1920 x 1200 for CRT Up to 1920 x1200 for HDMI Up to 1440 x 900 for LVDS1 (D2550) Up to 1366 x 768 for LVDS1 (N2600/N2800) Up to 1920 x 1200 for LVDS2 (D2550) Up to 1600 x 1200 for LVDS2 (N2600/N2800)
Dual Display	CRT+LVDS1 CRT+LVDS2

	CRT+HDMI LVDS1+HDMI LVDS2+HDMI
Super I/O	Winbond W83627UHG
BIOS	AMIBIOS
Storage	2 x SATA Connector 1 x Compact Flash II Slot for TB-522 or TB-523 (option）
Ethernet	2 x PCIe Gbe LAN by Intel 82583V
USB	4 x USB 2.0 stack ports for external 3 x USB 2.0 box Pin header for MIO1 1 x USB 2.0 internal for mini PCIe
Serial	1 x RS232/422/485 port, DB9 connector for external (COM1) pin 9 w/5V/12V/Ring select 1 x RS232 port, DB9 connector for external (COM2) pin 9 w/5V/12V/Ring select 1 x RS232 header for internal (COM5) 1 x RS232 header for internal (COM6),pin 10 w/5V/12V select I/O Card TB-522/TB-523: 1 x 422/485 select header for internal MIO1 (COM3) 1 x RS232 header for internal MIO1 (COM4)
Digital I/O	8-bit digital I/O by Pin header for MIO2 4-bit digital Input 4-bit digital Output
Battery	Support CR2477 Li battery by 2-pin header
Audio	Support Audio via Realtek ALC662 HD audio codec Support Line-out, MIC by JACK Support Line-in, Line-out, MIC by 2x6-pin header
Keyboard /Mouse	PS2 K/B and Mouse by MIO2 1 x PS/2 keyboard 1 x PS/2 mouse
Expansion Bus	1 x PC 104+ connector (PCI master 4, jumper for +3.3V & 5V select) 2 x PCI-express 1X extend by 4x10 pin socket (PCIe1 option) 1 x mini-PCI-express slot （PCIe1 option：MPCIE or PCIE1X） 1 x CRT 2x6 Pin Header
Power Management	1 x 3-pin power input connector (Wide range DC+9V~32V) DC12V output by 2x2 pin Connectors
Switches and	Power on/off switch by TB-522 or TB-523

LED Indicators	Reset switch by MIO2 Power LED status by MIO2 HDD LED status by MIO2
External I/O port	2 x COM Ports (COM1/COM2) 4 x USB 2.0 Ports (stack) 2 x RJ45 GbE LAN Ports 1 x CRT DB15 Port 1 x HDMI Port 1 x Audio Ports (mic, line out)
Watchdog Timer	Software programmable 1 – 255 second by Super I/O
Temperature	Operating: -20℃ to 70℃ Storage: -40℃ to 85℃
Humidity	10% - 90%, non-condensing, operating
Power Consumption	12V /1.25A (Intel Atom D2550 processor with 2GB DDR3 DRAM) 12V /1.18A (Intel Atom N2800 processor with 2GB DDR3 DRAM) 12V /0.95A (Intel Atom N2600 processor with 2GB DDR3 DRAM)
EMI/EMS	Meet CE/FCC class A

2.2 Board Dimensions

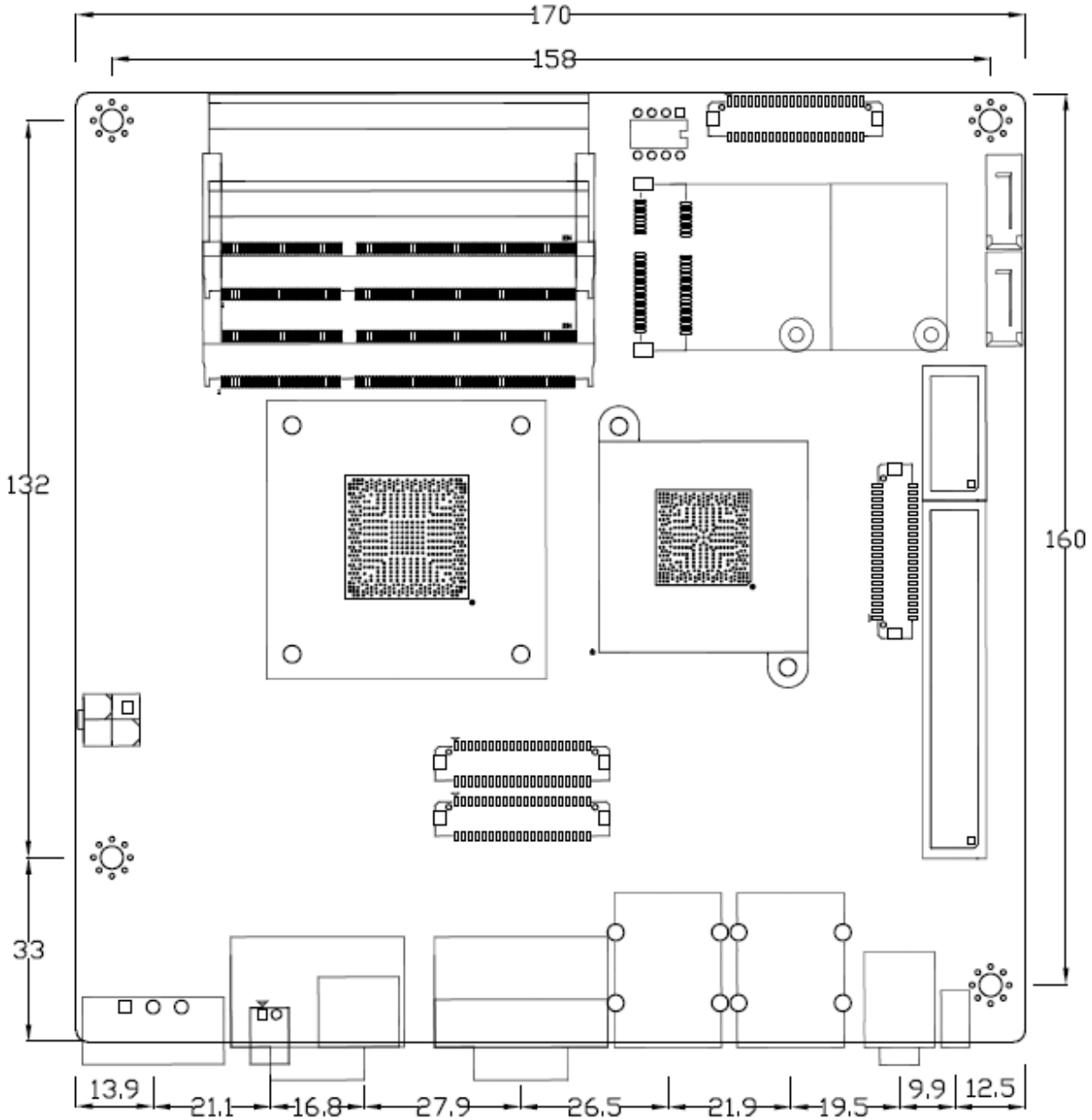


Figure 2.1: Mainboard Dimensions

2.3 Jumpers and Connectors Location

Board Top

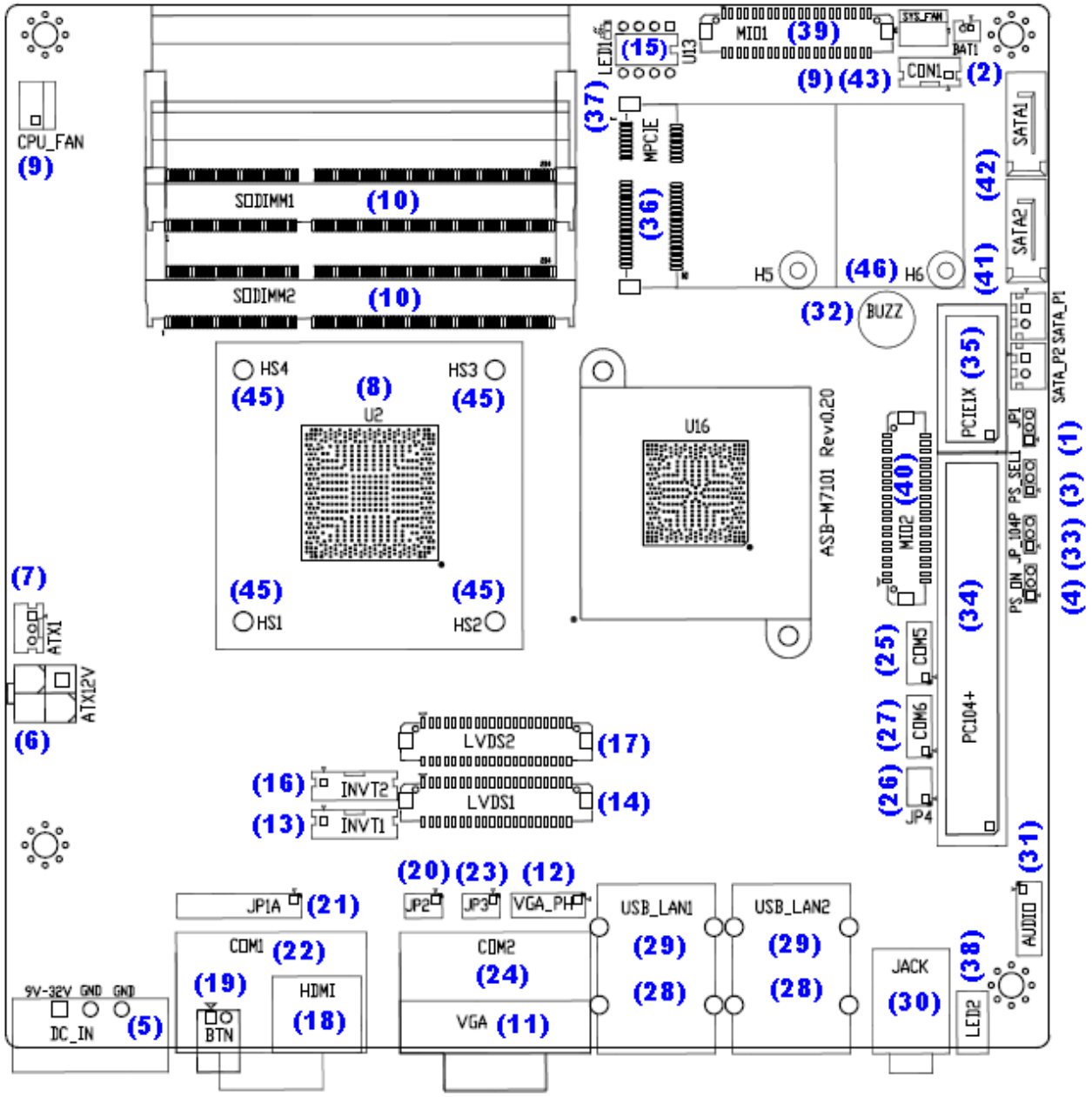


Figure 2.2 Jumpers and Connectors Location-TOP

Board Bottom

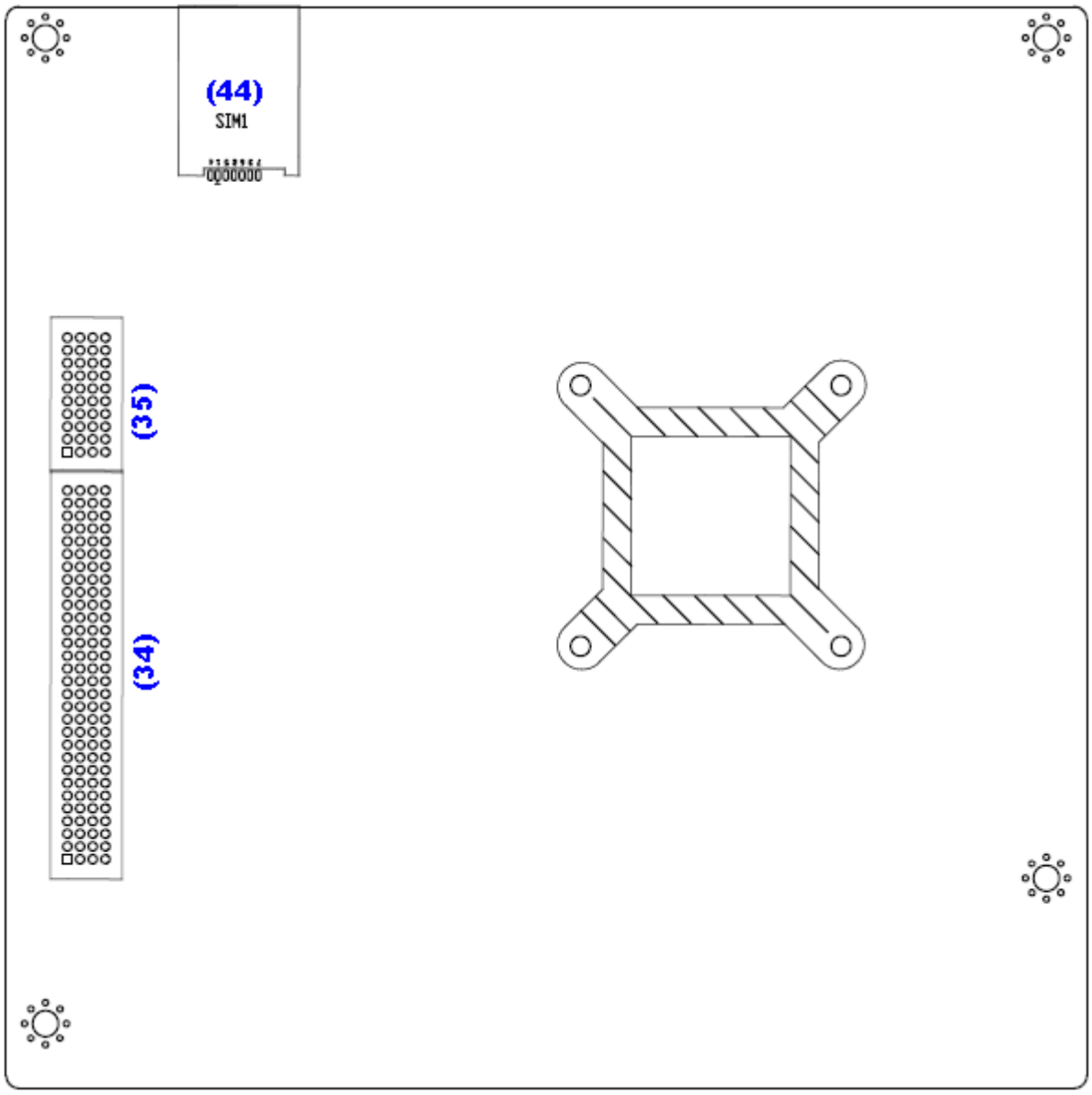


Figure 2.3: Jumpers and Connectors Location- Bottom

2.4 Jumpers Setting and Connectors

1. JP1:

(2.0mm Pitch 1X3 Pin Header)CMOS clear jumper, CMOS clear operation will permanently reset old BIOS settings to factory defaults.

JP1	CMOS
Close 1-2	NORMAL (Default)
Close 2-3	Clear CMOS

Procedures of CMOS clear:

a) Turn off the system and unplug the power cord from the power outlet.

b) To clear the CMOS settings, use the jumper cap to close pins2 and 3 for about 3 seconds then reinstall the jumper clip back to pins open.

c) Power on the system again.

d) When entering the POST screen, press the <F1> or <DEL> key to enter CMOS Setup Utility to load optimal defaults.

e) After the above operations, save changes and exit BIOS Setup.

2. BAT1:

(1.25mm Pitch 1X2 Pin wafer connector) 3.0V Li battery is embedded to provide power for CMOS.

Pin#	Signal Name
Pin1	VBAT
PIN2	Ground

3. PS_SEL1(option):

(2.0mm Pitch 1X3 Pin Header),DC in Power and ATX 12V IN Power jumper setting.

PS_SEL1	Mode
Close 1-2	**DC IN Power (Default)**
Close 2-3	ATX 12V_IN (ATX Power)

4. PS_ON:

(2.0mm Pitch 1X3 Pin Header),ATX Power and Auto Power on jumper setting.

JP2	Mode (DC_IN)
Close 1-2	**Auto Power on (Default)**
Close 2-3 or Open 1-2	ATX Power

5. DCIN:

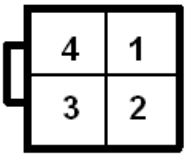
(5.08mm Pitch 1x3 Pin Connector),DC9V ~ DC32V System power input connector。

Pin#	Power Input
Pin1	DC+9V~32V
Pin2	Ground
Pin3	PG

Power Mode	Location : **DCIN** (5.4.5.)	Location: **ATX12V** (5.4.6.)	Location: **ATX1** (5.4.7.)
DC INPUT (Default)	**input** DC9~32V	**output** DC 12V	**NC**
ATX Power (option)	*NC*	*Input (DC12V) ATX Power 2*2P*	*PSON,GND,5VSB ATX Power*

6. ATX12V:

(2x2 Pin Connector),DC12V System power **output** connector.



Pin#	Power output (DCIN)
Pin1	Ground
Pin2	Ground
Pin3	DC+12V
Pin4	DC+12V

7. ATX1 (option):

(2.0mm Pitch 1X3 Pin wafer connector),connect PSON and 5VSB and Ground signal,support ATX Power model. **Reserved**.

Pin#	Signal Name
Pin1	ATX PSON
PIN2	ATX Ground
PIN3	ATX 5VSB

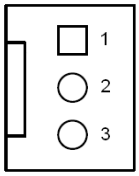
8. U2:

(FCBGA559), onboard CPU .

MODEL	CPU
ASB-M7101T-D2550	Intel Atom D2550 1.86GHz
ASB-M7101B-D2550 (option)	Intel Atom D2550 1.86GHz
ASB-M7101T-N2800 (option)	Intel Atom N2800 1.86GHz
ASB-M7101B-N2800 (option)	Intel Atom N2800 1.86GHz
ASB-M7101T-N2600 (option)	Intel Atom N2600 1.60GHz
ASB-M7101B-N2600 (option)	Intel Atom N2600 1.60GHz

9. CPU_FAN/SYS_FAN:

(2.54mm Pitch 1x3 Pin wafer connector),Fan connector, cooling fans can be connected directly for use. You may set the rotation condition of cooling fan in menu of BIOS CMOS Setup.



Pin#	Signal Name
1	Ground
2	VCC
3	Rotation detection

Note:

Output power of cooling fan must be limited under 5W.

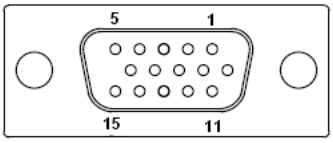
10. SODIMM1/SODIMM2:

(SO-DIMM 204Pin socket), DDRIII memory socket, the socket is located at the Top of the board and supports 204Pin 1.5V DDRIII 800/1066MHz FSB SO-DIMM memory module up to 4GB or 2GB. **The single RAM use SODIMM1 Slot.**

MODEL	Socket	Memory
ASB-M7101-D2550	SODIMM1/SODIMM2	Up to 4GB
ASB-M7101-N2800	SODIMM1/SODIMM2	Up to 4GB
ASB-M7101-N2600	SODIMM1	Up to 2GB

11. VGA:

(CRT DB15 Connector),Video Graphic Array Port, provide high-quality video output. **they can not work at the same time for VGA and VGA_PH**.



12. VGA_PH(option):

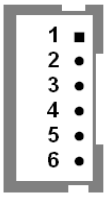
(CRT 2.0mm Pitch 2X6 Pin Header), Video Graphic Array Port, Provide 2x5Pin cable to VGA Port, **they can not work at the same time for VGA and VGA_PH**.

Signal Name	Pin#	Pin#	Signal Name
CRT_RED	1	2	Ground
CRT_GREEN	3	4	Ground
CRT_BLUE	5	6	VGA_EN
CRT_H_SYNC	7	8	CRT_DDCDATA
CRT_V_SYNC	9	10	CRT_DDCCLK
Ground	11	12	Ground

VGA hot plug setting for Windows XP：	
VGA1（Pin Header）	Function
Pin4-Pin6（Close）	VGA Simulation Disabled
Pin4-Pin6（Open）	VGA Simulation Enabled
use the 2.0mm jumper cap to close pin 4 and pin6	

13. INVT1:

(2.0mm Pitch 1x6 Pin wafer connector), Backlight control connector for LVDS1.



Pin#	Signal Name
1	+DC12V
2	+DC12V
3	Ground
4	Ground
5	BKLT_EN
6	BKLT_CTRL

Note:

Pin6 is backlight control signal, support DC or PWM mode, mode select at BIOS CMOS menu.

14. LVDS1:

(1.25mm Pitch 2x20 Connector, DF13A-40DP-1.25V),For 18/24-bit LVDS1 output connector, Fully supported by U2 Intel Processor, the interface features single channel 18/24-bit output. Low Voltage Differential Signaling, A high speed, low power data transmission standard used for display connections to LCD panels.

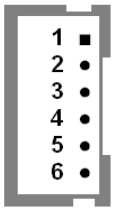
Signal Name	Pin#	Pin#	Signal Name
LVDS1_VDD5	2	1	LVDS1_VDD5
Ground	4	3	Ground
LVDS1_VDD33	6	5	LVDS1_VDD33
NC	8	7	LVDS_TX0_DN
NC	10	9	LVDS_TX0_DP
Ground	12	11	Ground
NC	14	13	LVDS_TX1_DN
NC	16	15	LVDS_TX1_DP
Ground	18	17	Ground
NC	20	19	LVDS_TX2_DN
NC	22	21	LVDS_TX2_DP
Ground	24	23	Ground
NC	26	25	LVDS_CLK_DN
NC	28	27	LVDS_CLK_DP
Ground	30	29	Ground
LVDS_DDC_DATA	32	31	LVDS_DDC_CLK
Ground	34	33	Ground
NC	36	35	LVDS_TX3_DN
NC	38	37	LVDS_TX3_DP
NC	40	39	NC

15. U13:

(2.54mm Pitch 2x4Pin Socket), AT24C02 socket, The EEPROM is set for the resolution of LVDS2. The resolution default is:**1280*1024**. **According to the needs of customers set.**

16. INVT2:

(2.0mm Pitch 1x6 Pin wafer connector), Backlight control connector for LVDS2.



Pin#	Signal Name
1	+DC12V
2	+DC12V
3	Ground
4	Ground
5	BKLT_EN
6	BKLT_CTRL

Note:

Pin6 is backlight control signal, support DC or PWM mode, mode select at BIOS CMOS menu.

17. LVDS2(option):

(1.25mm Pitch 2x20 Connector, DF13A-40DP-1.25V), For 18/24-bit LVDS2 output connector, Fully supported by Parad PS8625(DP to LVDS), the interface features dual channel 24-bit output. Low Voltage Differential Signaling, A high speed, low power data transmission standard used for display connections to LCD panels.

Signal Name	Pin#	Pin#	Signal Name
LVDS2_VDD5	2	1	LVDS2_VDD5
Ground	4	3	Ground
LVDS2_VDD33	6	5	LVDS2_VDD33
LB_D0_N	8	7	LA_D0_N
LB_D0_P	10	9	LA_D0_P
Ground	12	11	Ground
LB_D1_N	14	13	LA_D1_N
LB_D1_P	16	15	LA_D1_P
Ground	18	17	Ground
LB_D2_N	20	19	LA_D2_N
LB_D2_P	22	21	LA_D2_P
Ground	24	23	Ground
LB_CLKN	26	25	LA_CLKN
LB_CLKP	28	27	LA_CLKP
Ground	30	29	Ground
LVDS2_DDC_DATA	32	31	LVDS2_DDC_CLK
Ground	34	33	Ground
LB_D3_N	36	35	LA_D3_N
LB_D3_P	38	37	LA_D3_P
NC	40	39	NC

19. BTN:

POWER on/off Button, They are used to connect power switch button. The two pins are disconnected under normal condition. You may short them temporarily to realize system startup & shutdown or awaken the system from sleep state.

20. JP2:

(2.0mm Pitch 2x3 Pin Header),COM1 jumper setting, pin 1~6 are used to select signal out of pin 9 of COM1 port.

JP2 Pin#	Function
Close 1-2	**COM1 RI (Ring Indicator) (default)**
Close 3-4	COM1 Pin9=+5V (option)
Close 5-6	COM1 Pin9=+12V (option)

21. JP1A:

(2.0mm Pitch 2x10 Pin Header),COM1 jumper setting, it provides selectable RS232 / RS422/RS485 and hardware flow control serial signal output.

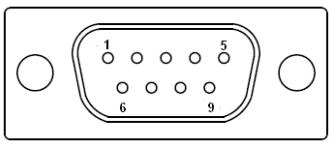
Function	JP1A Pin#
RS232 (Default)	**Close: Pin1-3, Pin2-4, Pin7-9, Pin8-10, Pin13-14**
RS422 (option)	Close: Pin3-5, Pin4-6, Pin9-11, Pin10-12, Pin17-18
RS485 (option)	Close: Pin3-5, Pin4-6, Pin9-11, Pin10-12, Pin15-16,

Hardware Flow Controll Jumper Setting

JP1A Pin#	Hardware Flow Controll
Pin19-Pin20	Close (Yes) default
Pin19-Pin20	Open (No)

22. COM1:

(Type DB9),Rear serial port, standard DB9 Male serial port is provided to make a direct connection to serial devices. COM1 port is controlled by pins No.1~6 of JP2,select output Signal RI or 5V or 12v, For details, please refer to description of JP2.



COM1/RS232 (Default):	
Pin#	Signal Name
1	DCD# (Data Carrier Detect)
2	RXD (Received Data)
3	TXD (Transmit Data)
4	DTR (Data Terminal Ready)
5	Ground
6	DSR (Data Set Ready)
7	RTS (Request To Send)
8	CTS (Clear To Send)
9	**RI/5V/12V (JP2 select Setting)**

COM1/RS422 (option):	
Pin#	Signal Name
1	422_RX+
2	422_RX-
3	422_TX-
4	422_TX+
5	Ground
6	NC
7	NC
8	NC
9	5V/12V (JP2 select Setting)

COM1/RS485 (option):	
Pin#	Signal Name
1	NC
2	NC
3	485-
4	485+
5	Ground
6	NC
7	NC
8	NC
9	5V/12V (JP2 select Setting)

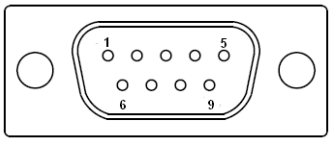
23. JP3:

(2.0mm Pitch 2x3 Pin Header),COM2 jumper setting, pin 1~6 are used to select signal out of pin 9 of COM2 port.

JP3 Pin#	Function
Close 1-2	**COM2 RI (Ring Indicator) (default)**
Close 3-4	COM2 Pin9=+5V (option)
Close 5-6	COM2 Pin9=+12V (option)

24. COM2:

(Type DB9),Rear serial port, standard DB9 Male serial port is provided to make a direct connection to serial devices.



Pin#	Signal Name
1	DCD# (Data Carrier Detect)
2	RXD (Received Data)
3	TXD (Transmit Data)
4	DTR (Data Terminal Ready)
5	Ground
6	DSR (Data Set Ready)
7	RTS (Request To Send)
8	CTS (Clear To Send)
9	**RI/5V/12V (JP3 select Setting)**

25. COM5:

(2.0mm Pitch 2X5 Pin Header),COM5 Port, standard RS232 ports are provided. They can be used directly via COM cable connection.

Signal Name	Pin#	Pin#	Signal Name
DCD	1	2	RXD
TXD	3	4	DTR
Ground	5	6	DSR
RTS	7	8	CTS
RI	9	10	NC

26. JP4:

(2.0mm Pitch 2x3 Pin Header) COM6 setting jumper, pin 1~6 are used to select signal out of pin 9 of COM6 port.

JP4 Pin#	Function
Close 1-2	**COM6 RI (Ring Indicator) (default)**
Close 3-4	COM6 Pin9=+5V (option)
Close 5-6	COM6 Pin9=+12V (option)

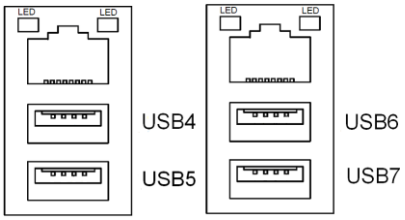
27. COM6:

(2.0mm Pitch 2X5 Pin Header), COM6 Port, standard RS232 ports are provided. They can be used directly via COM cable connection. COM6 port is controlled by pins No.1~6 of JP4,select output Signal 5V or 12v, For details, please refer to description of **JP4**.

Signal Name	Pin#	Pin#	Signal Name
DCD	1	2	RXD
TXD	3	4	DTR
Ground	5	6	DSR
RTS	7	8	CTS
RI/5V/12V (JP4 select Setting)	9	10	NC

28. USB4/USB5/USB6/USB7:

(Double stack USB type A), Rear USB connector, it provides up to 4 USB2.0 ports, speed up to 480Mb/s.

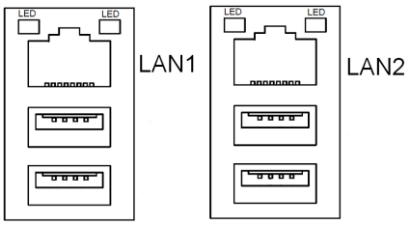


Each USB Type A Receptacle (2 Ports) Current limited value is 1.5A.

If the external USB device current exceeds 1.5A, please separate connectors into different Receptacle.

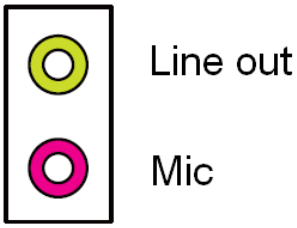
29. LAN1/LAN2:

(RJ45 Connector), Rear LAN port, Two standard 10/100/1000M RJ-45 Ethernet ports are provided. Used Intel 82583V chipset, LINK LED (green) and ACTIVE LED (yellow) respectively located at the left-hand and right-hand side of the Ethernet port indicate the activity and transmission state of LAN.



30. JACK:

(Diameter 3.5mm Double stack Jack), HD Audio port, An onboard Realtek ALC662 codec is used to provide high quality audio I/O ports. Line Out can be connected to a headphone or amplifier, MIC is the port for microphone input audio.



31. AUDIO(option):

(2.0mm Pitch 2X6 Pin Header), Front Audio, An onboard Realtek ALC662 codec is used to provide high-quality audio I/O ports. Line Out can be connected to a headphone or amplifier. Line In is used for the connection of external audio source via a Line in cable. MIC is the port for microphone input audio.

Signal Name	Pin#	Pin#	Signal Name
SPK_OUTL_P	1	2	SPK_OUTR_P
SPK_OUTL_N	3	4	SPK_OUTR_N
FRONT_JD	5	6	LINE1_JD
LINE-IN-L	7	8	LINE-IN-R
MIC2-IN-L	9	10	MIC2-IN-R
Ground	11	12	MIC2_JD

32. BUZZ:

Onboard buzzer.

33. JP_104P:

(2.0mm Pitch 1X3 Pin Header) PC104+ port voltage selection jumper, select voltage for PCI-104 Plus devices. **The default for this jumper is "all open",meaning the user must select the voltage to be used.**

JP_104P Pin#	PC104+ VIO Voltage
All Open	**Default**
Close 1-2	+3.3V PCI Card
Close 2-3	+5V PCI Card

34. PC104+ (option):

(4x30 Pin), PC104 plus connector, it conforms to standard PC104+ specification. Can expand support four PCI devices.

Model	PC104+ Connector
ASB-M7101T-D2550	Top
ASB-M7101B-D2550	Bottom (option)
ASB-M7101T-N2800	Top (option)

ASB-M7101B-N2800	Bottom (option)
ASB-M7101T-N2600	Top (option)
ASB-M7101B-N2600	Bottom (option)

35. PCIE1X (option):

(4x10 Pin), PCIe bus connector, it conforms to standard PCI Express x1 specification. Can expand support two PCIe devices.

PCIe1 Signal for PCIE1X or MPCIE Socket.

PCIe4 Signal for PCIE1X Socket.

Model	PCIE1X Connector
ASB-M7101T-D2550	Top
ASB-M7101B-D2550	Bottom (option)
ASB-M7101T-N2800	Top (option)
ASB-M7101B-N2800	Bottom (option)
ASB-M7101T-N2600	Top (option)
ASB-M7101B-N2600	Bottom (option)

36. MPCIE:

(Socket 52Pin),mini PCIe socket, it is located at the top, it supports mini PCIe devices with USB2.0,Smbus,SIM and PCIe signal. MPCIe card size is 30x30mm or 30x50.95mm.

PCIe1 Signal for PCIE1X or MPCIE Socket.

37. LED1:

LED1：Power LED Status.

38. LED2:

LED2：LED Status. Green LED for Motherboard Standby Power Good status, Yellow LED for HDD status.

39. MIO1:

(DF13-40P Connector),For expand output connector, It provides two RS232 ports or one RS485 port, three USB ports, one power led, one power button, via a dedicated cable connected **to TB-522 MIO1or TB-523 MIO1.**

Function	Signal Name	Pin#	Pin#	Signal Name	Function
COM3 RS422	422RX+	1	2	485+ / 422TX+	COM3 RS422 or 485
	422RX-	3	4	485- / 422TX-	
	Ground	5	6	WLAN_LED+	WLAN LED
	NC	7	8	WLAN_LED-	

	5V_S5	9	10	5V_S5	
COM4 RS232	DCD4-	11	12	RXD4	COM4 RS232
	TXD4	13	14	DTR4-	
	Ground	15	16	DSR4-	
	RTS4-	17	18	CTS4-	
	RI4-	19	20	5V_S5	
USB3	5V_S5	21	22	5V_USB_01	USB0
	USB3_N	23	24	USB0_N	
	USB3_P	25	26	USB0_P	
	Ground	27	28	Ground	
	Ground	29	30	Ground	
USB1	5V_USB_01	31	32	PWR_LED+	Power LED
	USB1_N	33	34	PWR_LED-	
	USB1_P	35	36	MIO_PSON	Power Button
	Ground	37	38	Ground	
	NC	39	40	AUTO_PS_ON	

40. MIO2:

(DF13-40P Connector),Front panel connector.

Function	Signal Name	Pin#	Pin#	Signal Name	Function
H_LED+	HDD_LED	1	2	PWR-LED	P_LED+
	NC	3	4	Ground	P_LED-
	NC	5	6	MIO_PSON-	PSON+
RESET+	RESET	7	8	Ground	PSON-
BUZZER+	BUZZER+	9	10	BUZZER-	BUZZER-
GPIO_IN_1	SIO_GPIO60	11	12	SIO_GPIO20	GPIO_OUT_1
GPIO_IN_2	SIO_GPIO61	13	14	SIO_GPIO21	GPIO_OUT_2
GPIO_IN_3	SIO_GPIO62	15	16	SIO_GPIO22	GPIO_OUT_3
GPIO_IN_4	SIO_GPIO63	17	18	SIO_GPIO23	GPIO_OUT_4
PS2_K/B	Ground	19	20	5V_S5_USB	PS2_Mouse
	PS2_KBDATA	21	22	PS2_MSDATA	
	PS2_KBCLK	23	24	PS2_MSCLK	
	5V_S5_USB	25	26	5V_S5_USB	
	NC	27	28	NC	
	NC	29	30	NC	
	Ground	31	32	Ground	
	5V_S5_USB	33	34	5V_S5_USB	
	NC	35	36	NC	
	NC	37	38	NC	
	Ground	39	40	Ground	

Pin1/Ground: **HDD LED**, They are used to connect hard disk activity LED. The LED blinks when the hard disk is reading or writing data.

Pin2/Pin4: **POWER LED**, They are used to connect power LED. When the system is powered on or under S0/S1 state, the LED is normally on, when the system is under S4/S5 state, the LED is off.

Pin7/Ground: **RESET Button**, They are used to connect reset button. The two pins are disconnected under normal condition. You may short them temporarily to realize system reset.

Pin6/Pin8: **POWER on/off Button**, They are used to connect power switch button. The two pins are disconnected under normal condition. You may short them temporarily to realize system startup & shutdown or awaken the system from sleep state.

Pin9/Pin10: **BUZZER**, They are used to connect an external buzzer.

Pin11~Pin18: **GPIO IN/GPIO OUT,** General-purpose input/output port, it provides a group of self-programming interfaces to customers for flexible use.

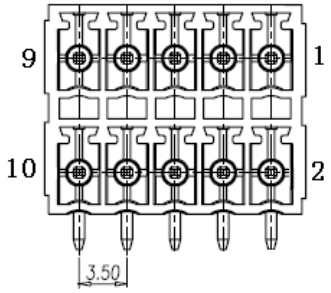
Pin19~Pin24: **PS2 KB/MS,** PS/2 keyboard and mouse port, the port can be connected to PS/2 keyboard and mouse via a dedicated cable for direct used.

Note:

When connecting LEDs and buzzer and GPIO and USB, pay special attention to the signal polarity. Make sure that the connector pins have a one-to-one correspondence with chassis wiring, or it may cause boot up failure.

41. GPIO:

(3.5mm Pitch 2x5 Pin Connector),General-purpose input/output port, it provides a group of self-programming interfaces to customers for flexible use.



Function	Pin#		Function
+5V	1	2	Ground
GPIO_IN1	3	4	GPIO_IN2
GPIO_IN3	5	6	GPIO_IN4
GPIO_OUT1	7	8	GPIO_OUT2
GPIO_OUT3	9	10	GPIO_OUT4

42. SATA_P1/SATA_P2:

(2.5mm Pitch 1x2 Pin wafer connector), Two onboard 5V output connectors are reserved to provide power for SATA devices.

Pin#	Signal Name
1	+DC5V
2	Ground

Note:

Output current of the connector must not be above 1A.

43. SATA1/SATA2:

(SATA 7P), SATA Connectors, Two SATA connectors are provided, with transfer speed up to 3.0Gb/s.

44. CON1(option):

(2.0mm Pitch 1x4 Pin wafer connector),Smbus Signal connector.

Pin#	Signal Name
1	SMB_CLK_MAIN_IO
2	3.3V
3	Ground
4	SMB_DATA_MAIN_IO

45. SIM1(option):

(SIM Socket 7Pin), Support SIM Card devices.

46. HS1/HS2/HS3/HS4(CPU SCREW HOLES):

CPU FAN SCREW HOLES, Four screw holes for fixed CPU Cooler assemble.

47. H5/H6:

MPCIE1 SCREW HOLES, H5 for mini PCIE card (30mmx30mm) assemble. H6 for mini PCIE card (30mmx50.95mm) assemble.

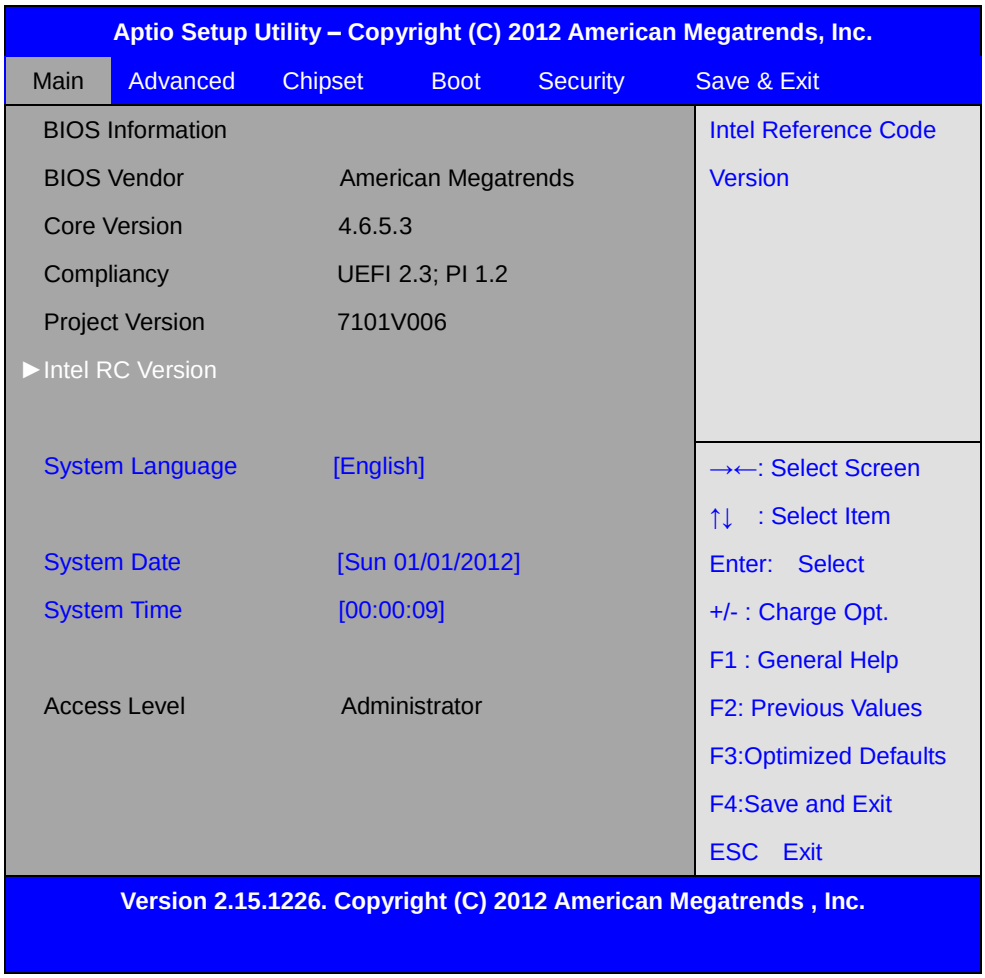
3.1 Operations after POST Screen

After CMOS discharge or BIOS flashing operation,.Press [Delete] key to enter CMOS Setup.

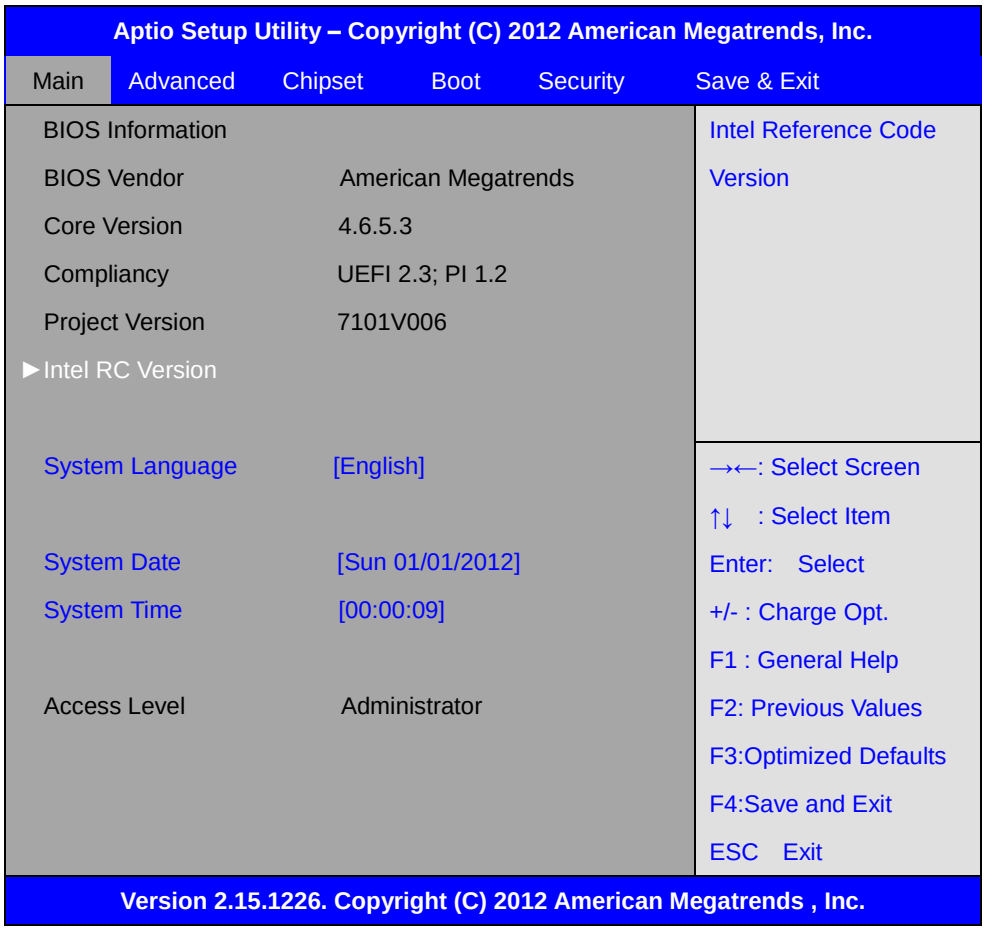
After optimizing and exiting CMOS Setup, the POST screen displayed for the first time is as follows and includes basic information on BIOS, CPU, memory, and storage devices.

3.2 BIOS Setup Utility

Press [Delete] key to enter BIOS Setup utility during POST, and then a main menu containing system summary information will appear.



3.3 Main Settings



System Time:

Set the system time, the time format is:

Hour : 0 to 23

Minute : 0 to 59

Second : 0 to 59

System Date:

Set the system date, the date format is:

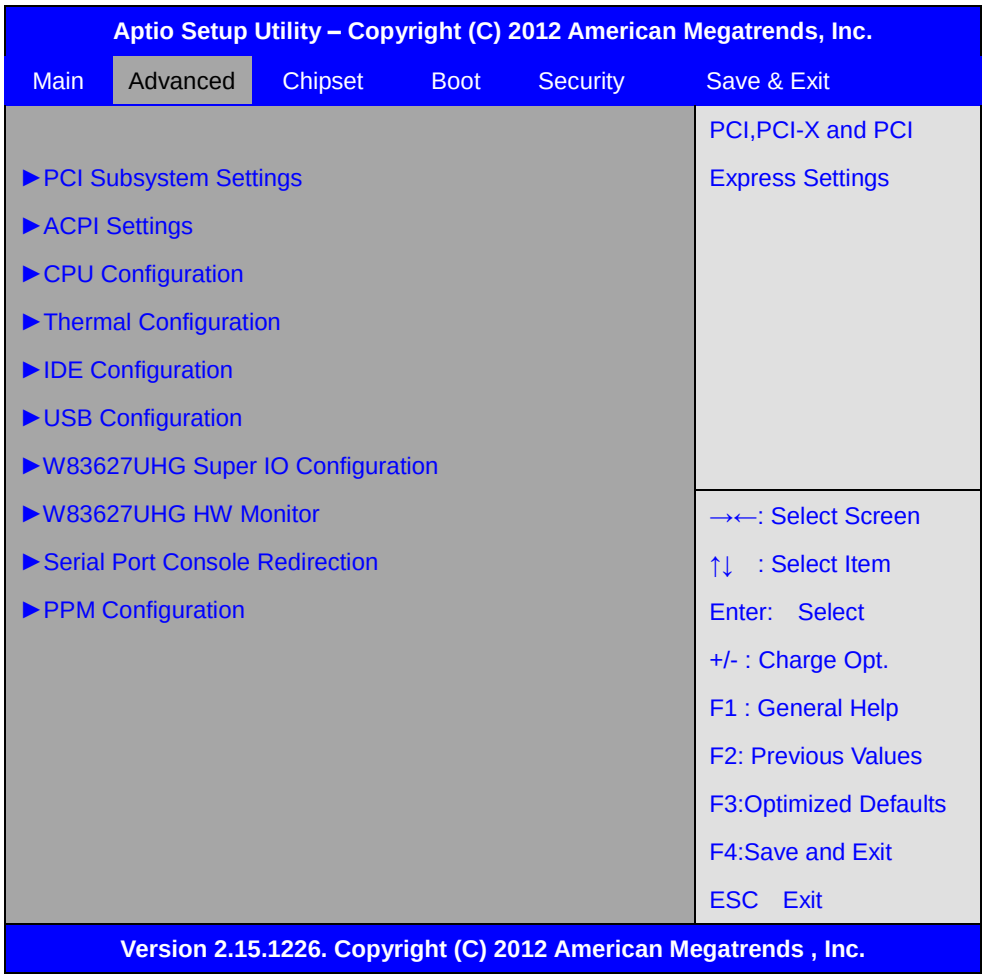
Day: Note that the 'Day' automatically changes when you set the date.

Month: 01 to 12

Date: 01 to 31

Year: 1998 to 2099

3.4 Advanced Settings



3.4.1 PCI Subsystem Settings

PCI Bus Driver Versio V2.05.02

PCI Common Settings:

PCI Latency Timer:

[32 PCI Bus Clocks]

[64 PCI Bus Clocks]

[96 PCI Bus Clocks]

[128 PCI Bus Clocks]

[160 PCI Bus Clocks]

[192 PCI Bus Clocks]

[224 PCI Bus Clocks]

[248 PCI Bus Clocks]

VGA Palette Snoop:

[Disabled]

[Enabled]

PERR# Generation:

[Disabled]

[Enabled]

SERR# Generation:

[Disabled]

[Enabled]

3.4.2 ACPI Settings

Enable ACPI Auto Conf:

[Disabled]

[Enabled]

Enable Hibernation:

[Enabled]

[Disabled]

ACPI Sleep State:

[Both S1 and S3 available for OS to choose from]

[Suspend Disabled]

[S1 only (CPU Stop Clock）]

[S3 only (Suspend to RAM)]

Lock Legacy Resources:

[Disabled]

[Enabled]

S3 Video Repost:

[Disabled]

[Enabled]

3.4.3 CPU Configuration

Processor Type	Intel(R) Atom(TM) CPU
EMT64	Not Supported
Processor Speed	1865 MHz
System Bus Speed	533 MHz
Ratio Status	14
Actual Ratio	14
System Bus Speed	533 MHz
Processor Stepping	30661
Microcode Revision	269

L1 Cache RAM 2x56 k

L2 Cache RAM 2x512 k

Processor Core Dual

Hyper-Threading Supported

Hyper-Threading:

[Enabled]

[Disabled]

Execute Disable Bit:

[Enabled]

[Disabled]

Limit CPUID Maximum:

[Disabled]

[Enabled]

3.4.4 Thermal Configuration

CPU Thermal Configuration

DTS SMM

[Disabled]

[Enabled]

Platform Thermal Configuration

Critical Trip Point [15C]

Active Trip Point Lo [55 C]

Active Trip Point Hi [71C]

Passive Trip Point [95]

Passive TC1 Value 1

Passive TC2 Value 5

Passive TSP Value 10

3.4.5 IDE Configuration

SATA Port0 Not Present

SATA Port1 Not Present

SATA Controller(S):

[Enabled]

[Disabled]

Configure SATA as:

[IDE]

[AHCI]

Misc Configuration for hard disk

3.4.6 USB Configuration

USB Configuration

USB Devices:

1 keyboard

Legacy USB Support:

[Enabled]

[Disabled]

EHCI Hand-off:

[Disabled]

[Enabled]

USB hardware delays a

USB transfer time-out:

[20 sec]

[10 sec]

[5 sec]

[1 sec]

Device reset time-out:

[20 sec]

[10 sec]

[30 sec]

[40 sec]

Device power-up delay

[Auto]

[Manual]

3.4.7 W83627UHG Super IO Ch Configuration

W83627UHG Super IO ch W83627UHG

Serial Port 1 Configuration

Serial Port 2 Configuration

Serial Port 3 Configuration

Serial Port 4 Configuration

Serial Port 5 Configuration

Serial Port 6 Configuration

3.4.8 W83627UHG HW Monitor

PC Health Status

Smart Fan Mode Configuration

System temperature1 : +46 C
System Speed : N/A
CPU Fan Speed : 5000 RPM
VCORE : +1.184 V
+12V : +12.512 V
+3.3V : +3.288 V
+1.5V : +1.528 V
AVCC : +5.170 V
VCC5V : +5.182 V
VSB5 : +5.170 V
VBAT : +3.368 V

3.4.9 Serial Port Console Redirection

COM0
Console Redirection
[Enabled]
[Disabled]
Console Redirection Settings
Serial Port for Out-of-Band Management/
Windows Emergency Management Services (EMS)
Console Redirection
[Disabled]
[Enabled]
Console Redirection Settings

3.4.10 PPM Configuration

PPM Configuration
EIST:
[Enabled]
[Disabled]
CPU C state Report
[Enabled]
[Disabled]
Enhanced C state
[Enabled]
[Disabled]
CPU Hard C4E
[Enabled]
[Disabled]
CPU C6 state
[Enabled]

[Disabled]

C4 Exit Timing

[Fast]

[Default]

[Slow]

C-state POPDOWN

[Enabled]

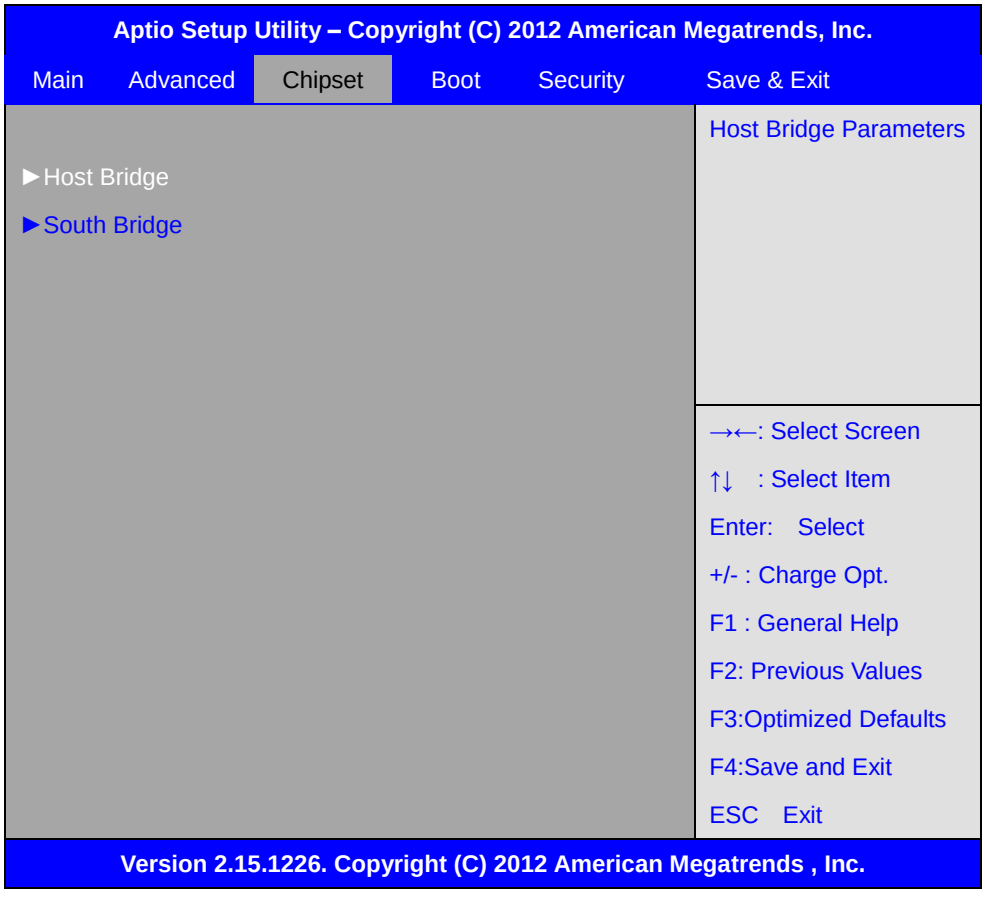
[Disabled]

C-state POPUP

[Enabled]

[Disabled]

3.5 Chipset Settings



3.5.1 Host Bridge

►Memory Frequency and Timing

►Intel IGD Configuration

******* Memory Information *******

Memory Frequency 1067 MHz(DDR3)

Total Memory	2048 MB
DIMM#0	Not Present
DIMM#1	2048 MB

Memory Frequency and Timing

MRC Fast Boot

[Enabled]

[Disabled]

Max TOLUD

[Dynamic]

[1GB]

[1.25GB]

[1.5GB]

[1.75GB]

[2GB]

[2.25GB]

[2.5GB]

[2.75GB]

[3GB]

[3.25GB]

Intel IGD Configuration

IGFX – Boot Type

[VBIOS Default]

[CRT]

[LVDS1]

[LVDS2]

[VGA + LVDS]

[VGA + HDMI]

LCD Panel Type

[VBIOS Default]

[640x480,18bit]

[800x480,18bit]

[800x600,18bit]

[1024x600,18bit]

[1024x768,18bit]

[1280x768,18bit]

[1280x800,18bit]

[1280x1024,18bit]

[1366x768,18bit]

[1024x768,24bit]

[1280x768,24bit]

[1280x800,24bit]
[1280x1024,24bit]
[1366x768,24bit]

Active LFP

[LVDS]
[No LVDS]
[EDP]

IGD Clock Source

[Internal Clock]
[External Clock]

Fixed Graphics Memory

[128MB]
[256MB]

ALS Support

[Disabled]
[Enabled]

Back light Control

[DC]
[PWM]

Backlight Logic

[Positive]
[Negative]

Backlight Control Lev

[Level 8]
[Level 0]
[Level 1]
[Level 2]
[Level 3]
[Level 4]
[Level 5]
[Level 6]
[Level 7]
[Level 9]
[Level 10]
[Level 11]
[Level 12]
[Level 13]
[Level 14]

[Level 15]

LVDS1 Setting:

IGFX – Boot Type: [LVDS1] or [CRT+LVDS]

Active LFP: [LVDS]

LVDS2 Setting:

IGFX – Boot Type: [LVDS2] or [CRT+LVDS]

Active LFP: [EDP]

3.5.2 South Bridge

TPT Devices

PCI Express Root Port 0

PCI Express Root Port 1

PCI Express Root Port 2

PCI Express Root Port 3

DMI Link ASPM Control

[Enabled]

[Disabled]

PCI-Exp. High Priorit

[Disabled]

[Enabled]

High Precision Event Timer Configuration

High Precision Timer

[Enabled]

[Disabled]

SLP_S4 Assertion Widt

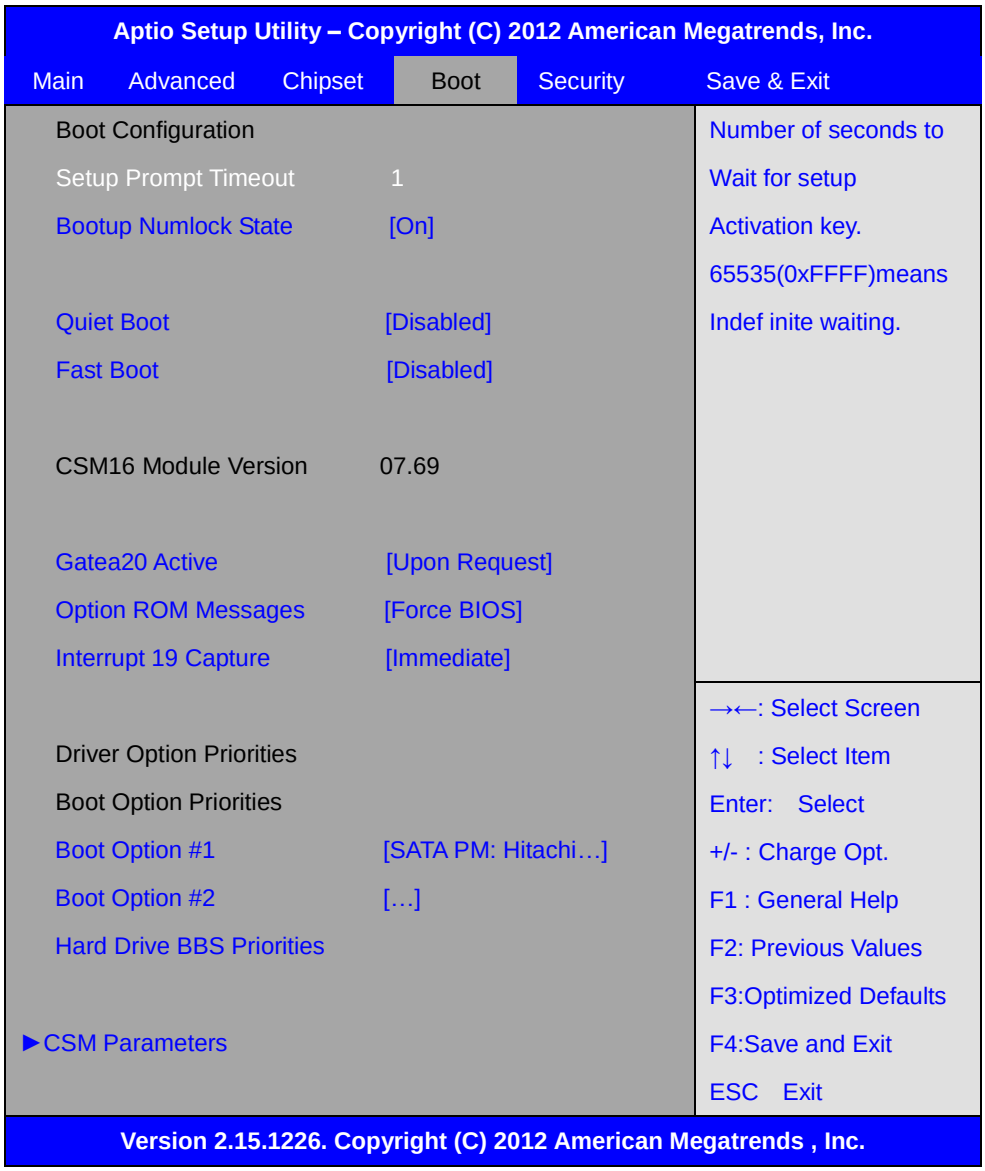
[1-2 Seconds]

[2-3 Seconds]

[3-4 Seconds]

[4-5 Seconds]

3.6 Boot Settings



Setup Prompt Timeout [1]

Bootup Numlock State

[On]

[off]

Quiet Boot

[Disabled]

[Enabled]

Fast Boot

[Disabled]

[Enabled]

CSM16 Module Version 07.69

Gatea20 Active

[Upon Request]

[Always]

Option ROM Messages

[Force BIOS]

[Keep Current]

Interrupt 19 Capture

[Enabled]

[Disabled]

Boot Option #1

Boot Option #2

……

Sets the system boot order

Hard Drive BBS Priorities [SATA PM:*** …]

Boot Option #1

SATA PM:***…

******

Disabled

CSM Parameters

Launch CSM

[Always]

[Never]

Boot option filter

[UEFI and Legacy]

[Legacy only]

[UEFI only]

Launch PXE OpROM poli

[Legacy only]

[Do not Launch]

[UEFI only]

Launch Storage OpROM

[Legacy only]

[Do not Launch]

[UEFI only]

Launch Video OpROM po

[Do not Launch]

[UEFI only]

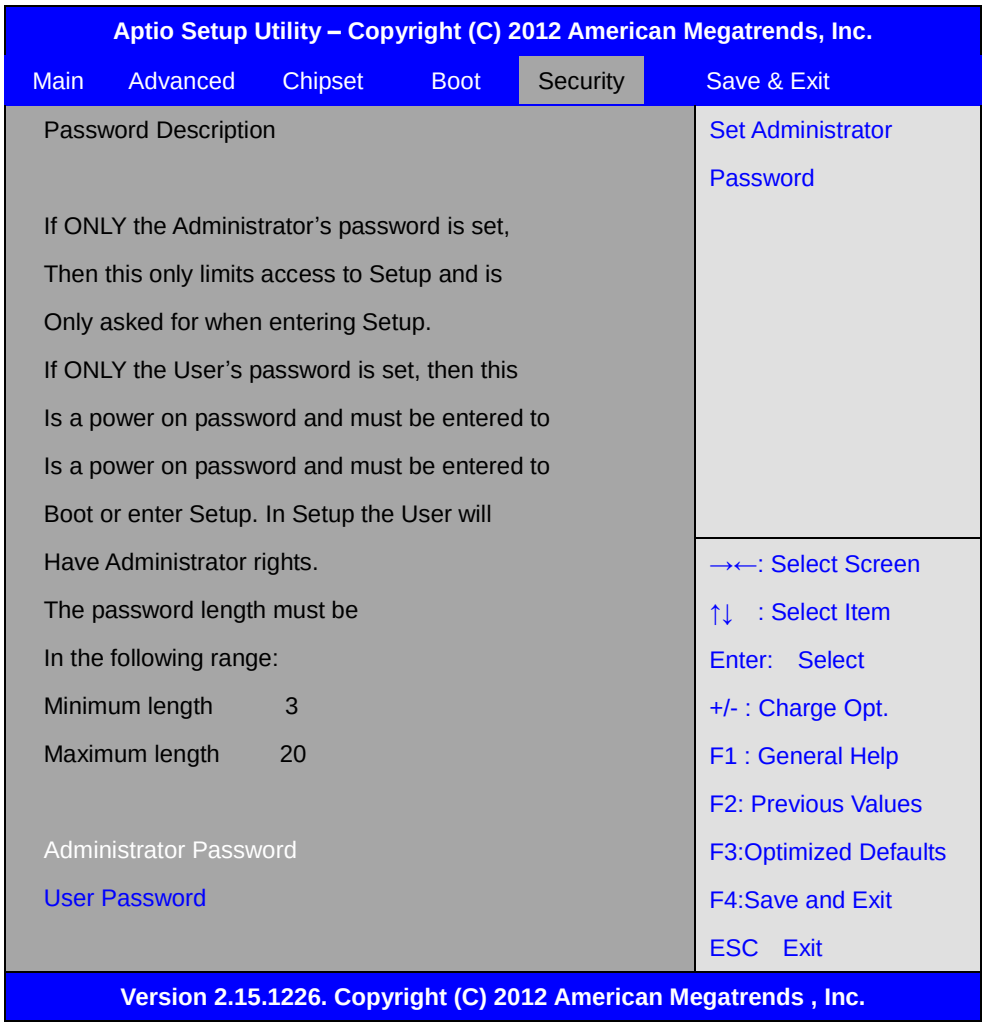
[Legacy only]

Other PCI device ROM

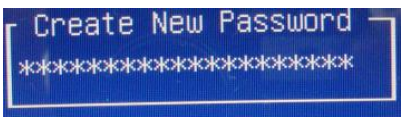
[UEFI OpROM]

[Legacy OpROM]

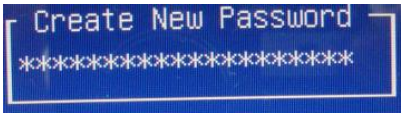
3.7 Security Settings



3.7.1 Administrator Password



3.7.2 User Password



Type the password with up to 20 characters and then press ⋖Enter⋗ key. This will clear all previously typed CMOS passwords. You will be requested to confirm the password. Type the password again and press ⋖Enter⋗ key. You may press ⋖Esc⋗ key to abandon password entry operation.

To clear the password, just press ⋖Enter⋗ key when password input window pops up. A confirmation message will be shown on the screen as to whether the password will be disabled. You will have direct access to BIOS setup without typing any password after system reboot once the password is disabled.

Once the password feature is used, you will be requested to type the password each time you enter BIOS setup. This will prevent unauthorized persons from changing your system configurations.

Also, the feature is capable of requesting users to enter the password prior to system boot to control unauthorized access to your computer. Users may enable the feature in Security Option of Advanced BIOS Features. If Security Option is set to System, you will be requested to enter the password before system boot and when entering BIOS setup; if Security Option is set to Setup, you will be requested for password for entering BIOS setup.

3.8 Save & Exit Settings

Save Changes and Exit

Save & Exit Setup save Configuration and exit ?

[Yes]

[No]

Discard Changes and Ext

Exit Without Saving Quit without saving?

[Yes]

[No]

Save Changes and Reset

Save & reset Save Configuration and reset?

[Yes]

[No]

Discard Changes and Reset

Reset Without Saving Reset without saving?

[Yes]

[No]

Save Changes

Save Setup Values Save configuration?

[Yes]

[No]

Discard Changes

Load Previous Values Load Previous Values?

[Yes]

[No]

Restore Defaults

Load Optimized Defaults Load optimized Defaults?

[Yes]

[No]

Save user Defaults

Save Values as User Defaults Save configuration?

[Yes]

[No]

Restore user Defaults

Restore User Defaults Restore User Defaults?

[Yes]

[No]

Launch EFI Shell from filesystem device

WARNING Not Found

[ok]

3.9 Examples of GPIO Programming

3.9.1 SuperIO Model: Winbond W83627UHG

- GPIO OUT use GP 60~63
- GPIO IN use GP 20~23

3.9.2 W83627UHG Access index port: 4Eh/4Fh

- Index Address Port: 4Eh
- Index Data Port: 4Fh

3.9.3 Configure GPIO register sequence

1. Enter the extended function mode
2. Select logic device number 8
3. Activate the logic device GPIO Port 6
4. Configure GPIO Port 6 register
5. Select logic device number 9
6. Activate the logic device GPIO Port 2
7. Configure GPIO Port 2 register
8. Exit the extended function mode

3.9.4 Read/write GPIO sequence

1. Enter the extended function mode
2. Select logic device number
3. Read/write GPIO register value
4. Exit the extended function mode

3.9.5 Software programming example

- **Enter the extended function mode**

Writing 87h to index address port twice will enter the extended function mode.

Example x86 assembly code:

```
mov dx, 4Eh
mov al, 87h
out dx, al
out dx, al
```

Example C code:

```
outportb(0x4E, 0x87);
outportb(0x4E, 0x87);
```

- **Exit the extended function mode**

Writing AAh to index address port will exit the extended function mode.

Example x86 assembly code:

```
mov dx, 4Eh
mov al, 0AAh
out dx, al
```

Example C code:

```
outportb(0x4E, 0xAA);
```

- **Select logic device number**

Example x86 assembly code:

```
mov dx, 4Eh
mov al, 007h ;LDN selection register
out dx, al
mov dx, 4Fh
mov al, 008h ;Select LDN=8, GPIO Port6
;or Select LDN9, GPIO Port2
out dx, al
```

Example C code:

```
outportb(0x4E, 0x07); //LDN selection register
outportb(0x4F, 0x08); //Select LDN=8, GPIO Port6
or
outportb(0x4E, 0x07); //LDN selection register
outportb(0x4F, 0x09); //Select LDN=9, GPIO Port2
```

- **Activate the logic device**

Example x86 assembly code:

```
mov dx, 4Eh
mov al, 030h ;Logic device activation control reg.
out dx, al
mov dx, 4Fh
n al, dx
or al, 004h ;Set bit2 to enable GPIO Port6 if LDN=8
or al, 002h ;Set bit1 to enable GPIO Port2 if LDN=9
out dx, al
```

Example C code:

```
outportb(0x4E, 0x30); //Logic device activation control
outportb(0x4F, (inportb(0x4F)|0x2));
//Set bit[1] to enable GPIO Port2 if LDN=9
Or
```

outportb(0x4E, 0x30); //Logic device activation control
outportb(0x4F, (inportb(0x4F)|0x4));
//Set bit[2] to enable GPIO Port6 if LDN=8

- **Configure GPIO register**

Example x86 assembly code:

```
mov dx, 4Eh
mov al, 0E6h ;GPIO inversion reg.
out dx, al
mov dx, 4Fh
mov al, 000h ;0 – normal, 1 - inverted
out dx, al

mov dx, 4Eh
mov al, 0E4h ;GPIO I/O selection reg.
out dx, al
mov dx, 4Fh
mov al, 0FFh ;0 – Output, 1 – Input
;or mov al, 0F0h to set output
out dx, al
```

Example C code:

```
outportb(0x4E, 0xE6); //GPIO I/O selection reg.
outportb(0x4F, 0x0); //0 – normal, 1 – inverted

outportb(0x4E, 0xE4); //GPIO inversion reg.
outportb(0x4F, 0xFF); //0 – Output, 1 - Input
or
outportb(0x4E, 0xE4); //GPIO inversion reg.
outportb(0x4F, 0xF0); //0 – Output, 1 – Input
```

- **Read GPIO value**

Example x86 assembly code:

```
mov dx, 4Eh
mov al, 0E5h ;GPIO data reg.
out dx, al
mov dx, 4Fh
in al, dx ;Bit[3::0] = GPI[3::0] value
```

Example C code:

```
outportb(0x4E, 0xE5); //GPIO data reg.
```

```
GP = inportb(0x4F); //Bit[3::0] = GPI[3::0]
```

- **Write GPIO value**

Example x86 assembly code:

```
;Set GPO62
mov dx, 4Eh
mov al, 0E5h ;GPIO data reg.
out dx, al
mov dx, 4Fh
in al, dx
or al, 00000100b ;Bit2 = GPO62
out dx, al

;Clear GPO62
mov dx, 4Eh
mov al, 0E5h ;GPIO data reg.
out dx, al
mov dx, 4Fh
in al, dx
and al, not 00000100b
out dx, al
```

Example C code:

```
//Set GPO62
outportb(0x4E, 0xE5); //GPIO data reg.
Outportb(0x4F, (inportb(0x4F)|0x4)); //Set Bit[2]

//Clear GPO62
outportb(0x4E, 0xE5); //GPIO data reg.
Outportb(0x4F, (inportb(0x4F)&0xFB)); //Clear Bit[2]
```

- **The followings are C language source code:**

```
#include "stdio.h"
#include "conio.h"

//Super I/O index access port
#define INDEXP 0x4E
#define DATAP 0x4F

//Enter super I/O programming mode
#define ENTERPRG { \
```

```
outportb(INDEXP, 0x87); \
outportb(INDEXP, 0x87);}

//Super I/O index write
#define WRITEREG(reg,val) { \
outportb(INDEXP, reg); \
outportb(DATAP, val);}

//Exit super I/O programming mode
#define EXITPRG { \
outportb(INDEXP, 0xAA);}

//Select logic device number
#define SELETDEV(ldn) { \
outportb(INDEXP, 7); \
outportb(DATAP, ldn); }

//Initialize the GPIO port2
int InitGP2() {

//Start the super I/O chip programming
ENTERPRG

//Select the logical device 9, GP2
SELETDEV(9)

//Activate GP1
WRITEREG(0x30, (inportb(0x30)|0x2))

WRITEREG(0xE6, 0x0)
WRITEREG(0xE4, 0xFF)

//Exit the super I/O chip programming
EXITPRG

return 0;
}

//Initialize the GPIO port6
int InitGP6() {
```

```
//Start the super I/O chip programming
ENTERPRG

//Select the logical device 8, GP6
SELETDEV(8)

//Activate GP1
WRITEREG(0x30, (inportb(0x30)|0x4))

WRITEREG(0xE6, 0x0)
WRITEREG(0xE4, 0xF0)

//Exit the super I/O chip programming
EXITPRG

return 0;
}

//Read GPIO Port2
unsigned char ReadGP2() {
unsigned char cGP2;

//Start the super I/O chip programming
ENTERPRG

//Select the logical device 9, GP2
SELETDEV(9)

//Read GPIO Value
outportb(INDEXP, 0xE5);
cGP2 = inportb(DATAP);
GP2 = cGP2 & 0xF;

//Exit the super I/O chip programming
EXITPRG

return cGP2;
}

//Write GPIO Port6
int WriteGP6(unsigned char cGP6) {
```

```
//Start the super I/O chip programming
ENTERPRG

//Select the logical device 8, GP6
SELETDEV(8)

//Write GP1 value
WRITEREG(0xE5, cGP6)

//Exit the super I/O chip programming
EXITPRG

return 0;
}

int main() {
unsigned char cGP;

//Initialize the GPIO port
InitGP2();
InitGP6();

//Read GPIO Port 2
cGP = ReadGP2();
printf("\nRead GPIO Port 2 Status: %X", cGP);

//Write GPIO Port 6
WriteGP6(cGP);
printf("\nSet GPIO Port 6 Status: %X", cGP);

return 0;
```

Chapter 4 Installation of Drivers

This chapter describes the installation procedures for software and drivers under the windows 7. The software and drivers are included with the motherboard. The contents include **Intel Chipset NM10 Express, Intel(R) VGA Chipset, Intel(R) 82583V Driver, Realtek ALC662 Audio Driver.** Installation instructions are given below.

Important Note:
After installing your Windows operating system (Windows 7), you must install first the Intel Chipset Software Installation Utility before proceeding with the installation of drivers.

4.1 Intel Chipset Driver

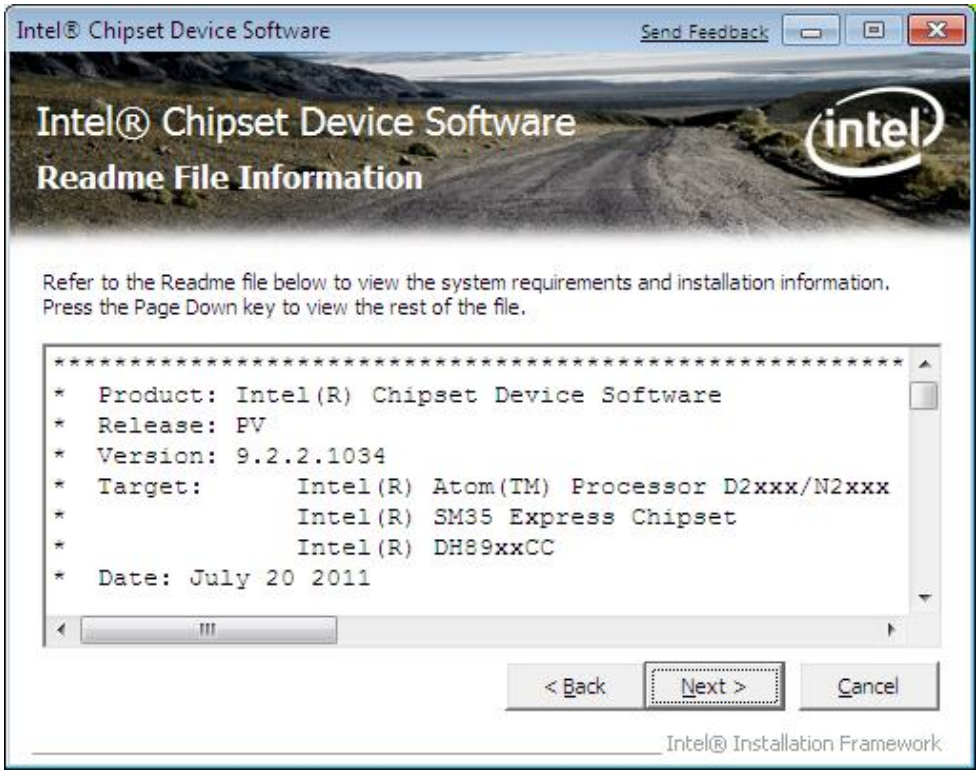
To install the Intel chipset driver, please follow the steps below.

Step 1. Access drivers list as shown below. Select **Intel(R) Chipset NM10 Express** from the list

Step 2. Welcome screen appears. Click **Next** to setup program.

Step 3. Read the License Agreement. Click **Yes** to continue.

Step 4. The Read me file appears. Click **Next** to continue.



Step 5. Setup operations are performed.

Step 6. Once the set up operations are completed, select **Yes, I want to restart this computer now**. Click **Finish**.

4.2 Intel VGA Chipset Driver

To install the VGA drivers, follow the steps below to proceed the installation.

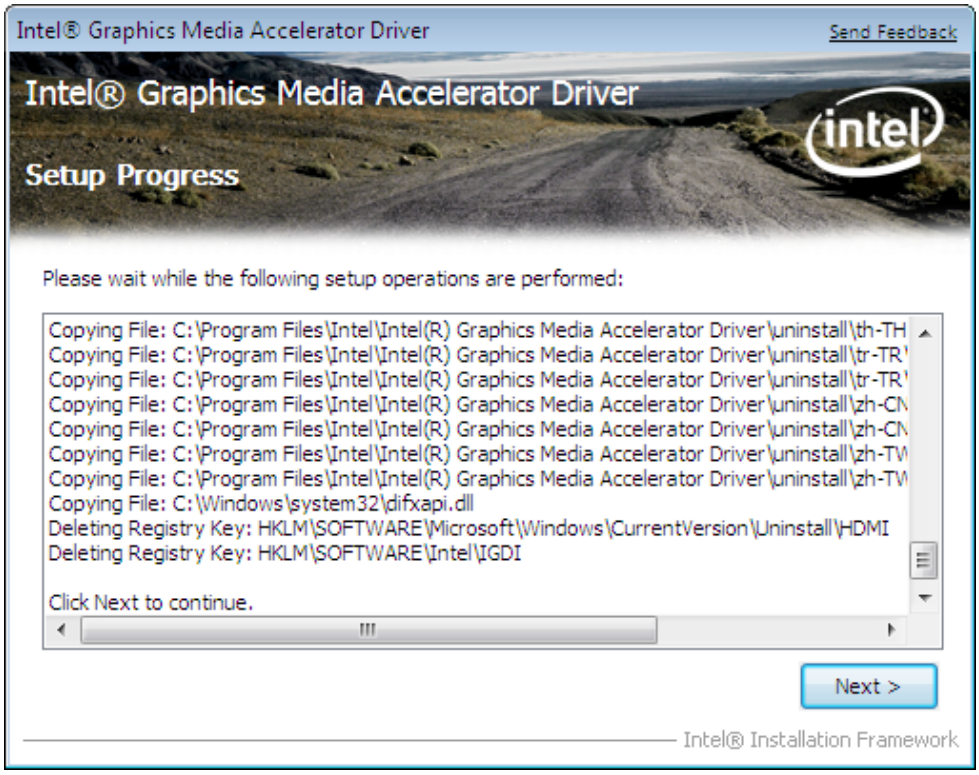
Step 1. Access drivers list as shown below. Select **Intel(R) VGA Chipset Driver**.

Step 2. Tick Automatically run WinSAT and enable the Windows Aero desktop theme(if supported). Click **Next** to continue.

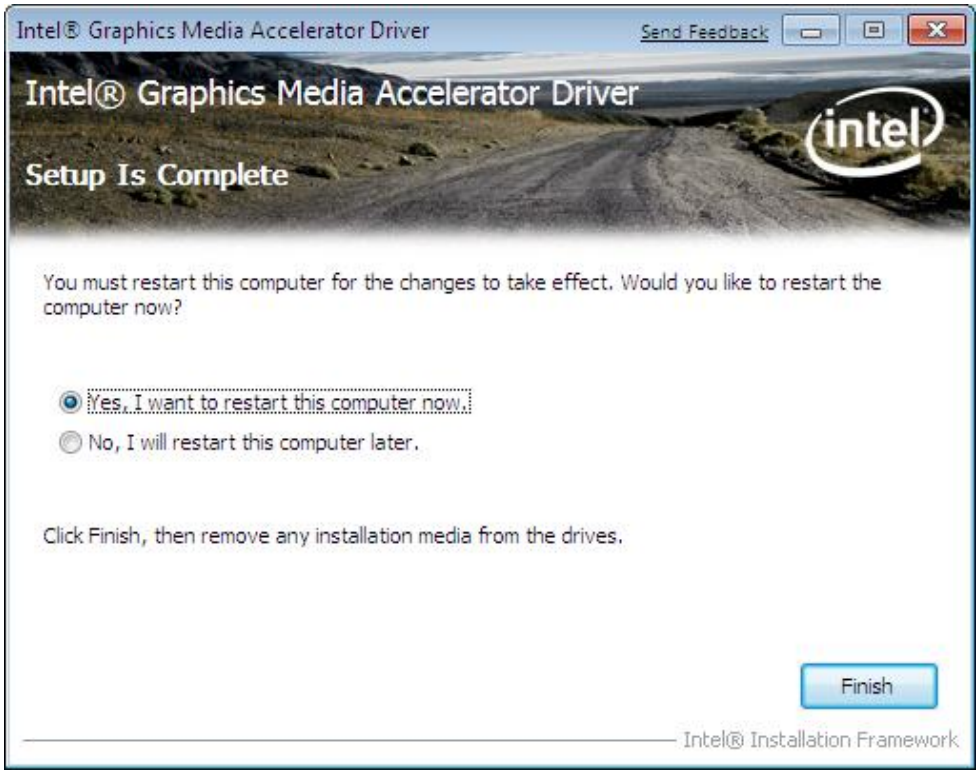
Step 3. Read license agreement. Click **Yes** to continue.

Step 4. The read me file appears, click **Next** to continue.

Step 5 Click **Next**.



Step 6. Click **Yes, I want to restart this computer now.** Click **Finish**.

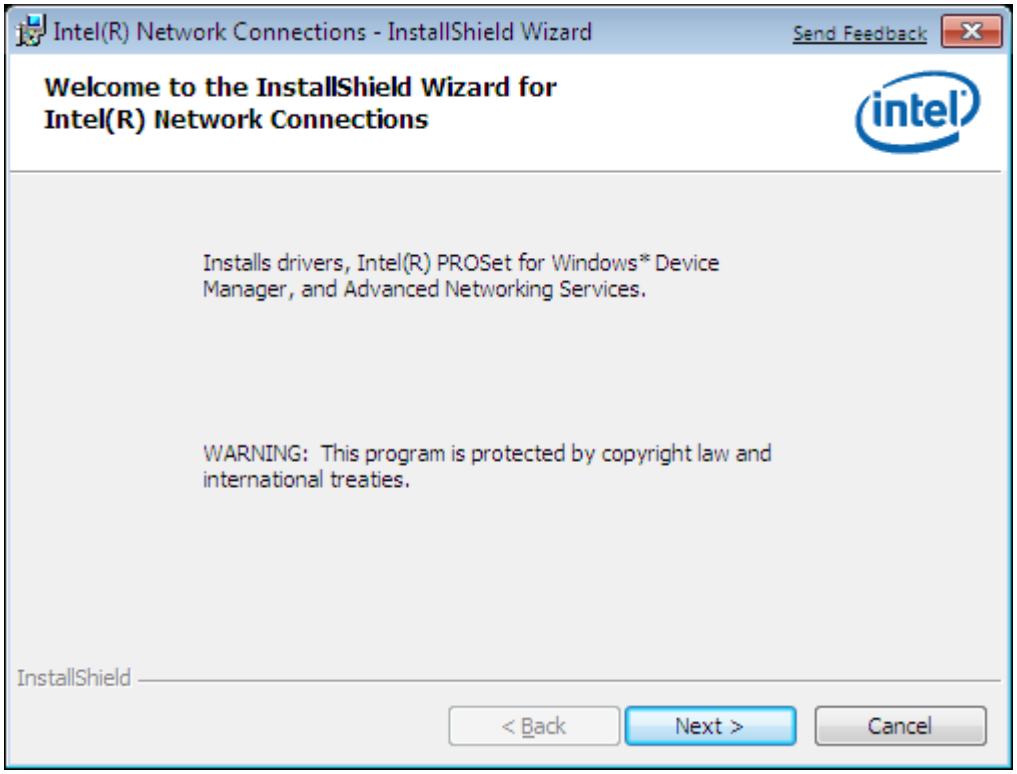


4.3 Intel Network Adapter Driver

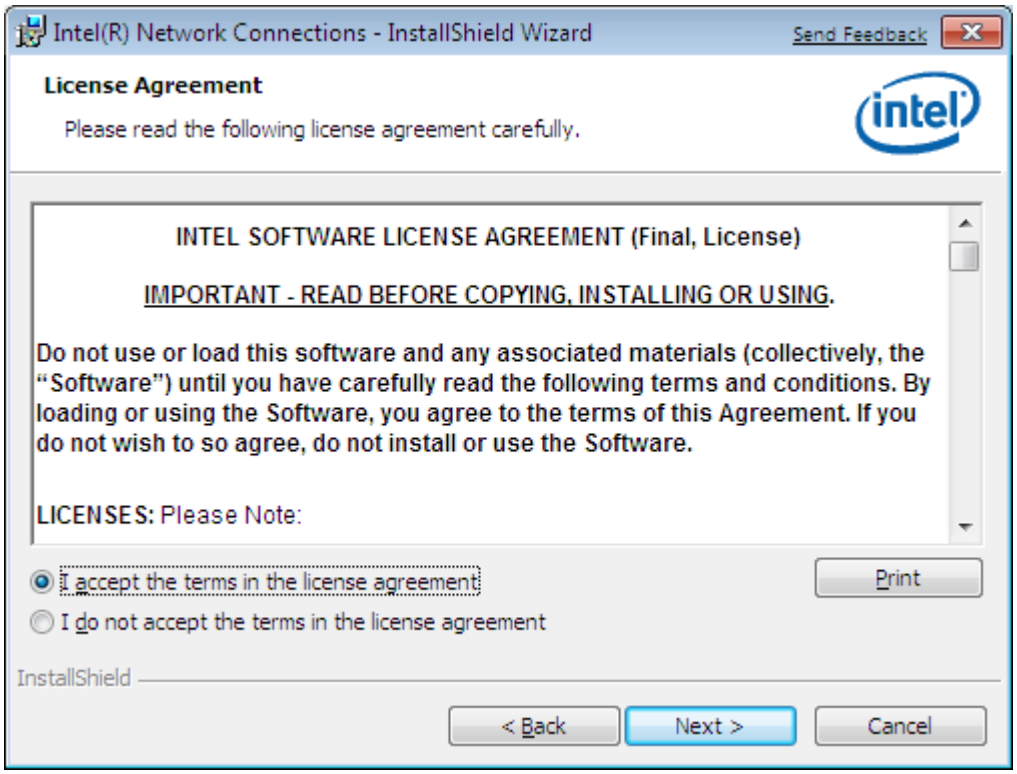
To install the Intel 82574L Network adapter Driver, please follow the steps below.

Step 1. Access drivers list as shown below. Select **Intel 82583V Driver** from the list

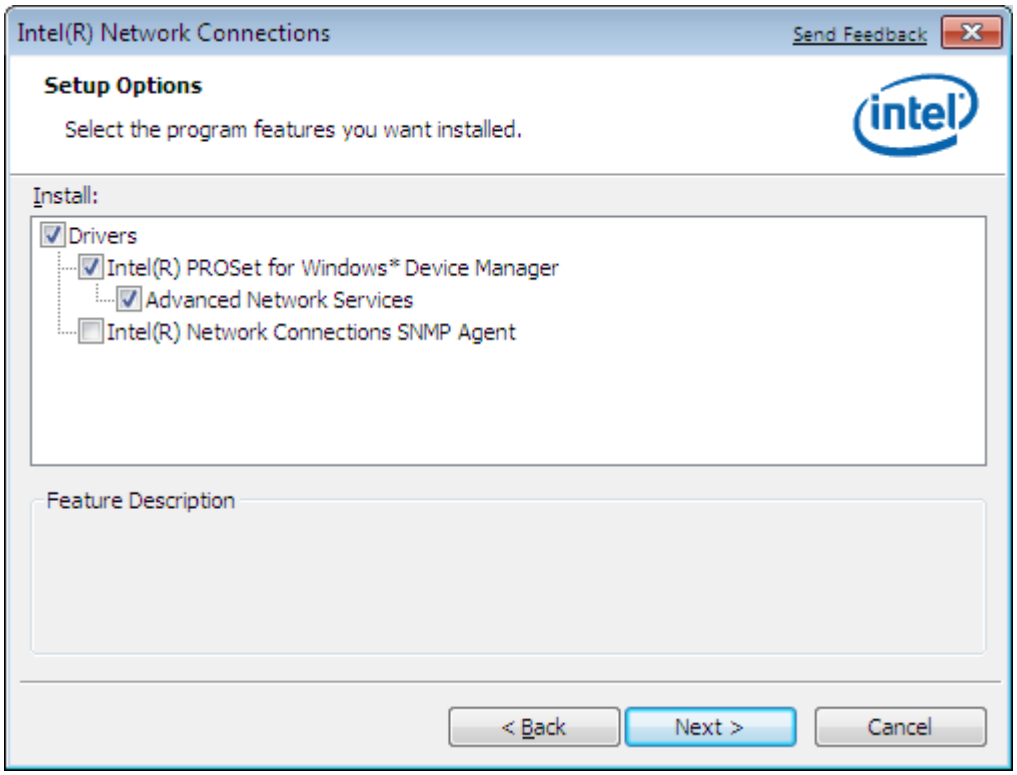
Step 2. The installation files are extracted as shown below. Click **Next** to continue.



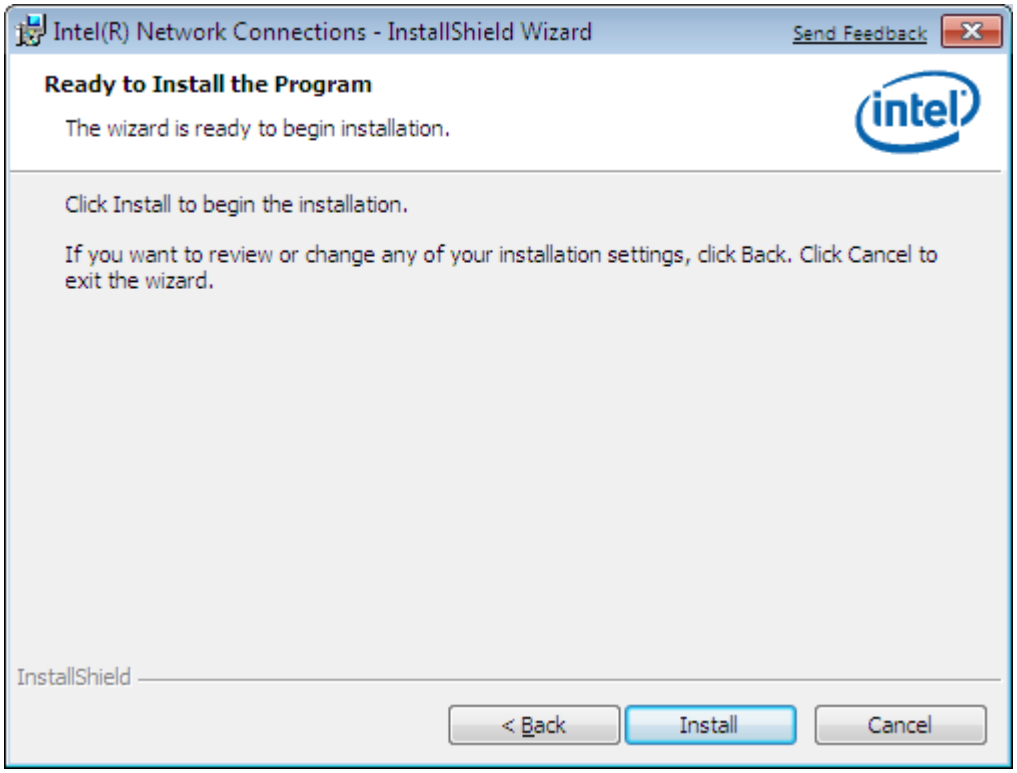
Step 3. Read the License Agreement. Select **I accept the terms in the license agreement.** Click **Next** to continue.



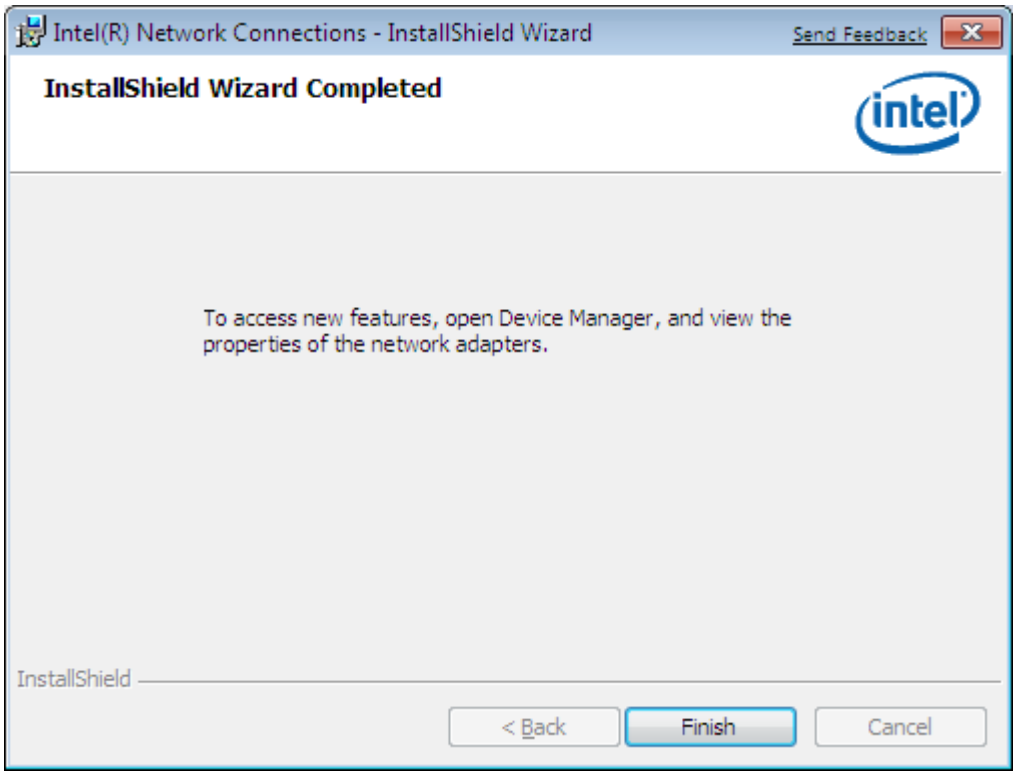
Step 4. Tick **Drivers/Intel(R) PROSet for Windows* Device Manager/Advanced Network Services**. Click **Next** to continue.



Step 5. Click **Install** to begin the installation.



Step 6. Click **Finish**.

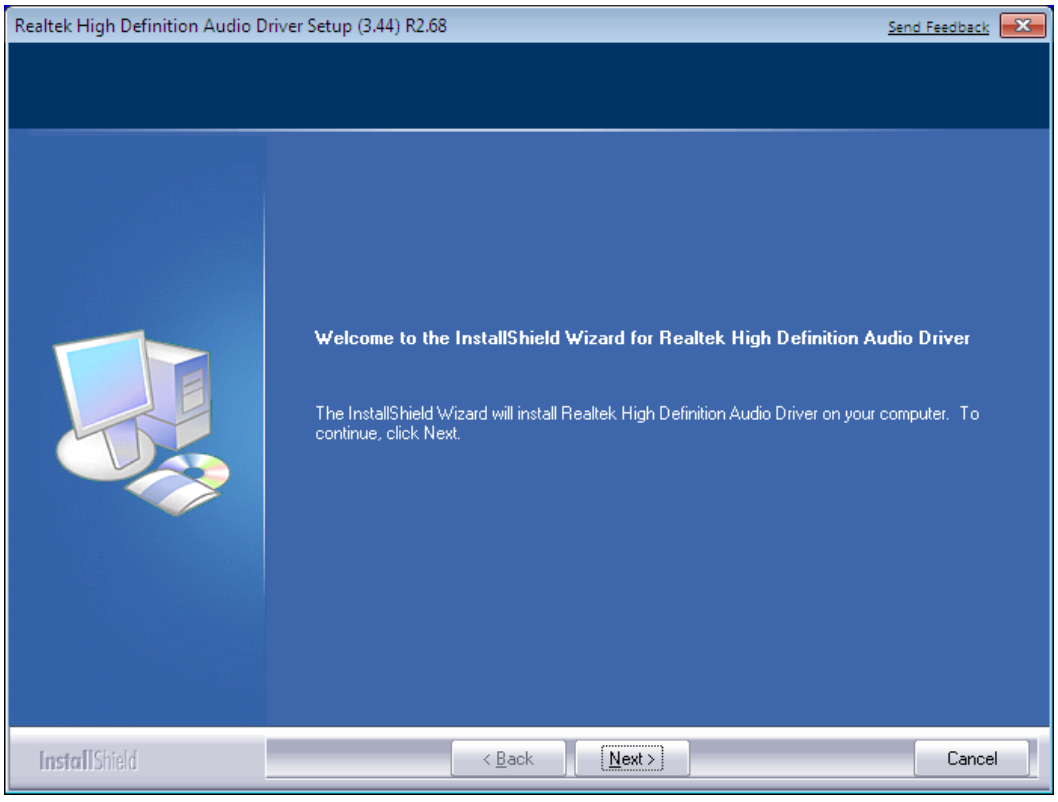


4.4 Realtek Audio Driver Installation

To install the Realtek ALC662 Audio Codec Driver, please follow the steps below.

Step 1. Access drivers list as shown below. Select **Realtek ALC662 Audio Codec Driver** from the list

Step 2. The installation files are extracted. Click **Next** to continue.



Step 3. Click **Yes, I want to restart my computer now.** to continue.