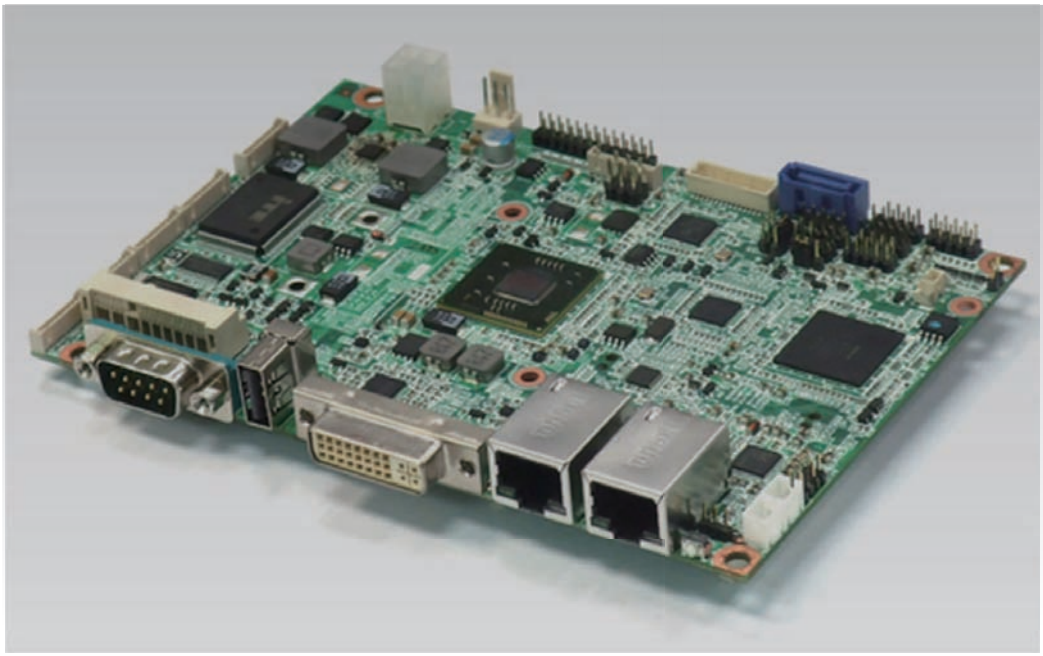
OXY5321A

3.5" Single Board Computer
User's Manual



Safety Information

Electrical safety

- To prevent electrical shock hazard, disconnect the power cable from the electrical outlet before relocating the system.
- When adding or removing devices to or from the system, ensure that the power cables for the devices are unplugged before the signal cables are connected. If possible, disconnect all power cables from the existing system before you add a device.
- Before connecting or removing signal cables from the motherboard, ensure that all power cables are unplugged.
- Seek professional assistance before using an adapter or extension cord. These devices could interrupt the grounding circuit.
- Make sure that your power supply is set to the correct voltage in your area.
- If you are not sure about the voltage of the electrical outlet you are using, contact your local power company.
- If the power supply is broken, do not try to fix it by yourself. Contact a qualified service technician or your local distributor.

Operation safety

- Before installing the motherboard and adding devices on it, carefully read all the manuals that came with the package.
- Before using the product, make sure all cables are correctly connected and the power cables are not damaged. If you detect any damage, contact your dealer immediately.
- To avoid short circuits, keep paper clips, screws, and staples away from connectors, slots, sockets and circuitry.
- Avoid dust, humidity, and temperature extremes. Do not place the product in any area where it may become wet.
- Place the product on a stable surface.
- If you encounter any technical problems with the product, contact your local distributor

Statement

Revision History

Revision	Date (dd.mm.yyyy)	Changes
Version 1.0	29.11.2012	Initial release
Version 1.1	22.01.2013	Enable COM5 Add FP2 jumper setting

Packing list

- ☐ OXY5321A 3.5” SBC
- ☐ CD (Driver + user's manual)
- ☐ CPU cooler

Optional Accessories

- ☐ Cable kit for OXY5321A

Ordering Information

Model Number	Description
OXY5321A-ET	3.5" SBC Intel® Cedarview D2550 with DDR3 SODIMM, Dual Display by LVDS/DVI-I, Dual GbE LAN, Audio, 5 x COM, 7 x USB, and 12V DC-in (-20 to 70°C)
OXY5321A-UT	3.5" SBC Intel® Cedarview D2550 with DDR3 SODIMM, Dual Display by LVDS/DVI-I, Dual GbE LAN, Audio, 5 x COM, 7 x USB, and 12V DC-in (-40 to 85°C optional)

If any of the above items is damaged or missing, please contact your local distributor.

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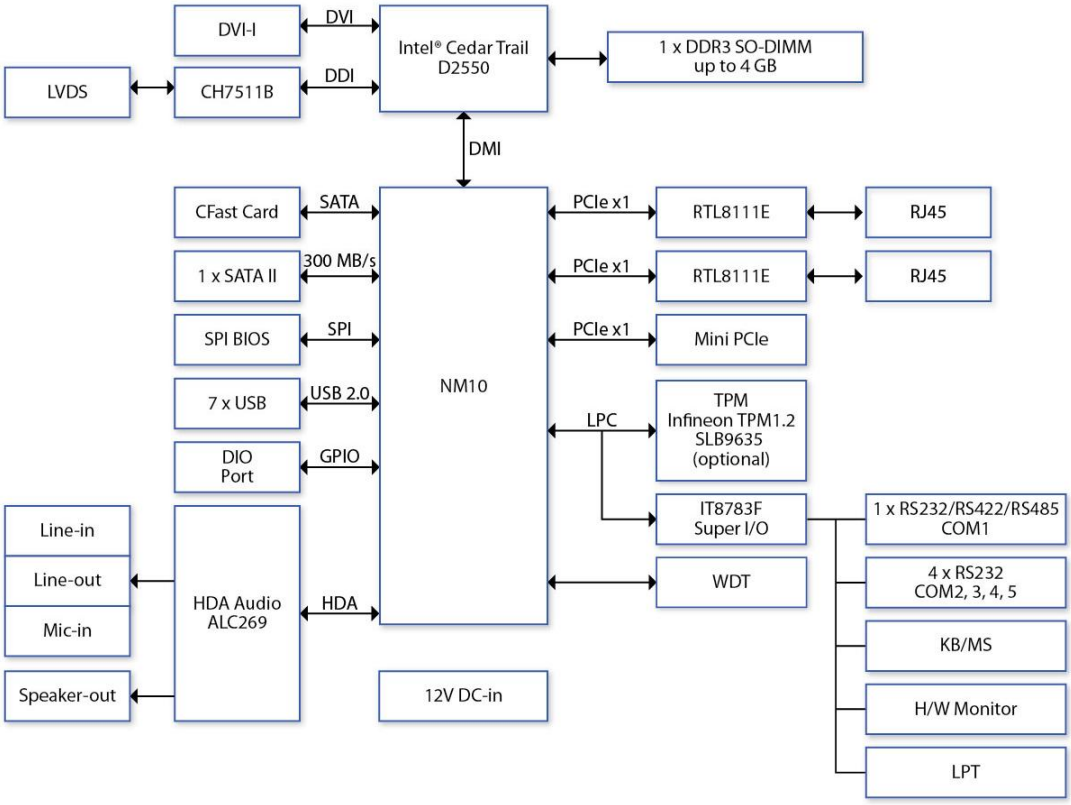
Chapter 1: Product Information

1.1 Block Diagram



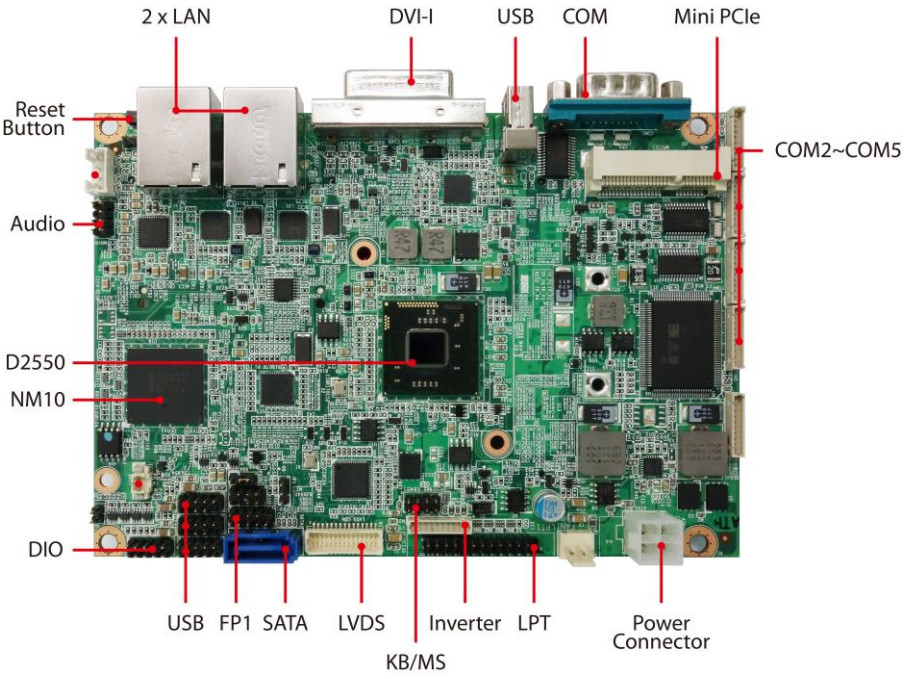
1.2 Specifications

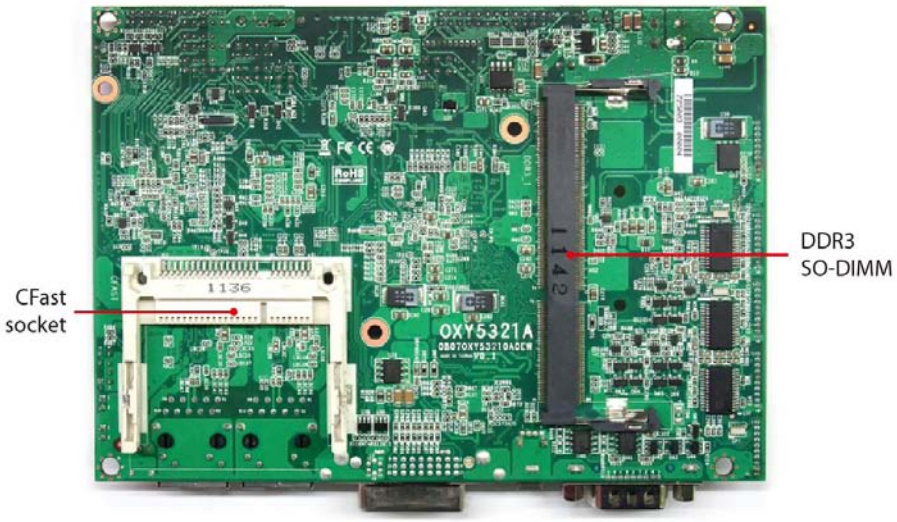
Processor & System	
CPU Type	Intel® Atom™ D2550 1.86 GHz
Chipset	Intel® NM10
Memory Type	1 x 204-pin SO-DIMM DDR3 800/1066 MHz up to 4 GB
BIOS	AMI® BIOS
Supoer I/O	ITE IT8783F
Watchdog	1-255 sec. or 1-255 min. software programmable, can generate system reset
Expansion Slot	1 x Mini PCIe
Display	
Chipset	Integrated Intel® GMA3650 VR Graphic core SGX545
DVI-I	Yes (Max. resolution 1920 x 1200 @ 60 Hz)
LVDS	Supports 18/24-bit single/dual channel LVDS (Max. resolution 2560 x 1600 @ 60 Hz)
Dual Independent Displays Capability	LVDS + DVI-I
Audio	
Codec	Realtek ALC269 High Definition Audio Codec *2W amplifier onboard
Ethernet	
Chipset	2 x RTL8111E GbE LAN
WOL	Yes
Boot from LAN	Yes for PXE
Rear I/O	
DVI-I	1 (DVI-D + VGA)
Ethernet	2 x RJ45
USB	1 x USB2.0
COM	1 x RS-232/422/485 with 5V/12V selectable
Reset Button	1
Internal I/O	
SATA	1 x SATAII (3 Gb/s)
SSD	1 x CFast socket
USB	6 x USB2.0 ports by 2 x 5-pin header
COM	4 x COM ports
	COM2~COM5 ports support RS232 only with 5V/12V selectable by 1x10-pin header
Audio	1 x 4-pin header for Speak-out
LVDS	30-pin connector
PS/2	2 x 4-pin header
LPT	2 x 13-pin header
DIO	8-bit (4 in/4 out)

Mechanical and Environment	
Form Factor	3.5" SBC
Power Type	12V DC-in, 4-pin ATX power connector, AT/ATX mode support
Dimension	146 x 102 mm (5.7" x 4")
Operating Temp.	-20 to 70°C
Storage Temp.	-20 to 85°C
Relative Humidity	10% to 90%, non-condensing

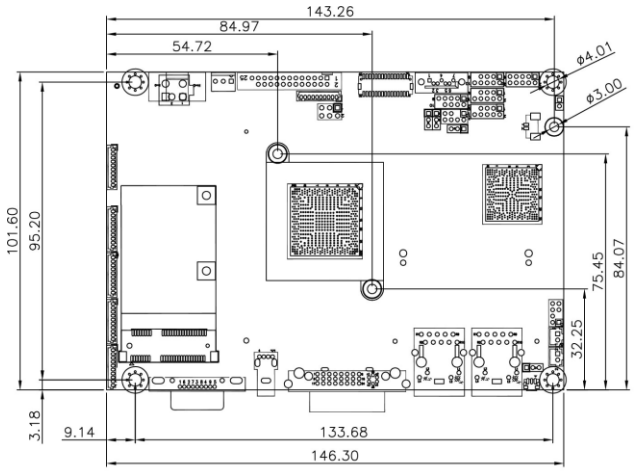
*All specifications and photos are subject to change without notice.

1.3 Board Placement

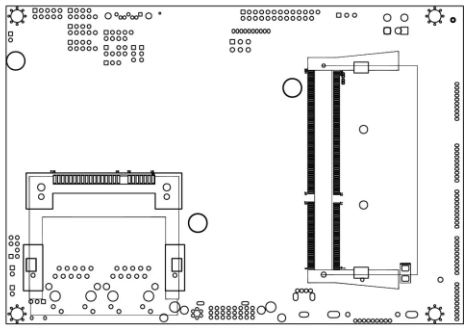




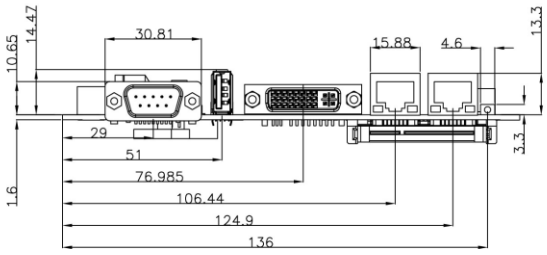
1.4 Mechanical Drawings



TOP VIEW

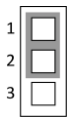
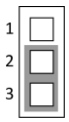


BOTTOM VIEW

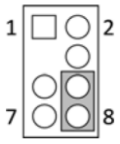
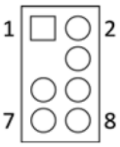


Chapter 2: Jumpers and Connectors

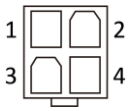
PSON1: ATX/AT mode Selection

Jumper	Function description	Setting
1-2	AT Mode	
2-3	ATX Mode	
Default setting is 2-3		

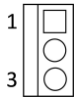
FP2: Front Panel 2 Pin Header

Jumper	Function description	Setting
6-8 short (Default)	No LVDS support	
6-8 open	LVDS support	
Default setting is 2-3		

ATX1: Power input connector

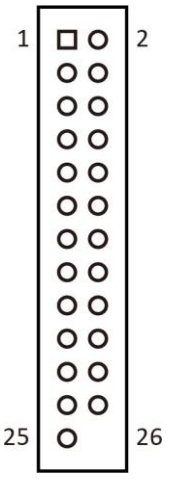
Pin	Definition	
1	GND	
2	GND	
3	+12V	
4	+12V	

FAN: 3 pin FAN connector

Pin	Definition	
1	GND	
2	+12V	
3	FANIN_CPU	

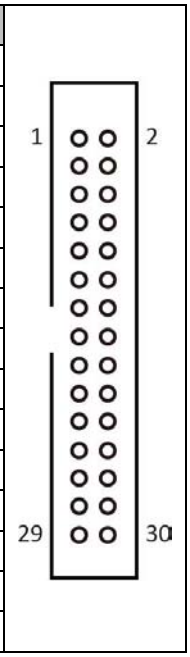
LPT1: LPT port pin header

Pin	Definition	Pin	Definition
1	STB#	2	AFD#
3	SPD0	4	ERROR#
5	SPD1	6	PINIT#
7	SPD2	8	SLIN#
9	SPD3	10	GND
11	SPD4	12	GND
13	SPD5	14	GND
15	SPD6	16	GND
17	SPD7	18	GND
19	ACK#	20	GND
21	BUSY	22	GND
23	PE	24	GND
25	SLCT	26	



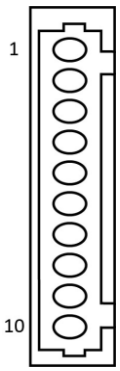
LVDS_CON: LVDS Connector

Pin	Definition	Pin	Definition
1	LVDS_BCLK	2	GND
3	LVDS_BCLK#	4	LVDS_A3
5	GND	6	LVDS_A3#
7	LVDS_B3	8	GND
9	LVDS_B3#	10	LVDS_ACLK
11	LVDS_B2	12	LVDS_ ACLK #
13	LVDS_B2#	14	GND
15	LVDS_B1	16	LVDS_A2
17	LVDS_B1#	18	LVDS_A2#
19	LVDS_B0	20	LVDS_A1
21	LVDS_B0#	22	LVDS_A1#
23	GND	24	LVDS_A0
25	LVDS_DCC_SC	26	LVDS_A0#
27	LVDS_DCC_SD	28	GND
29	LVDS_VDD	30	LVDS_VDD



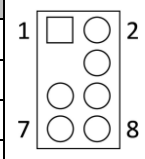
JBKL1: Inverter connector

Pin	Definition
1	VCC12_LVDSP
2	VCC12_LVDSP
3	VCC12_LVDSP
4	VCC_LVDSP
5	VCC_LVDSP
6	GND
7	GND
8	BL_EN
9	BL_ADJ
10	GND



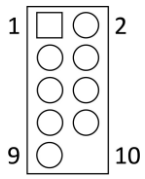
KBMS1: KB/MS Pin Header

Pin	Definition	Pin	Definition
1	+5VSB	2	GND
3		4	GND
5	MSDAT_SIO	6	KBDAT_SIO
7	MSCLK_SIO	8	KBCLK_SIO



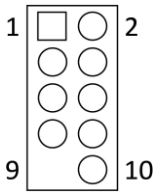
FP1: Front Panel 1 Pin Header

Pin	Definition	Pin	Definition
1	HDLED+	2	PLED+
3	HDD_ACT_	4	PLED-
5	GND	6	PWRBTN_
7	SYSRST_	8	GND
9	DUMMY	10	



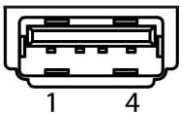
USB1, USB2, USB3: USB2.0 Pin Header

Pin	Definition	Pin	Definition
1	FUSEVCC	2	FUSEVCC
3	USBN	4	USBN
5	USBP	6	USBP
7	GND	8	GND
9		10	GND



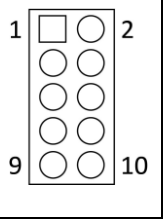
RUSB1: USB2.0 port 6 connector

Pin	Definition
1	+5V
2	USBN
3	USBP
4	GND



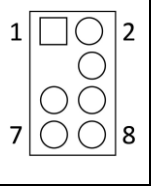
DIO1: Digital input/output pin header

Pin	Definition	Pin	Definition
1	SBDO0	2	SBDI0
3	SBDO1	4	SBDI1
5	SBDO2	6	SBDI2
7	SBDO3	8	SBDI3
9	+5VIO	10	GND



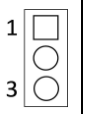
AUDIO1: LINE-OUT/LINE-IN/MIC-IN

Pin	Definition	Pin	Definition
1	L_IN_L	2	L_IN_R
3		4	AGND
5	MIC_IN	6	AGND
7	L_OUT_R	8	L_OUT_L



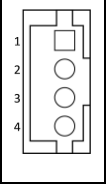
SPDIF1: SPDIF OUT pin header

Pin	Definition
1	+5V
2	SPDIF_OUT
3	GND



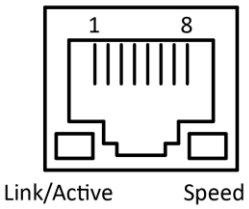
AMP1: AMP output pin header

Pin	Definition
1	SP_OUT_R-
2	SP_OUT_R+
3	SP_OUT_L+
4	SP_OUT_L-



LAN1, LAN2: LAN connector

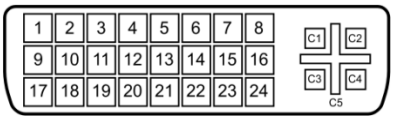
Pin	Definition	Pin	Definition
R5	VCC	R6	VCC
R1	TD1+	L3	YLED-
R2	TD1-	L4	YLED+
R3	TD2+	L1	GLED-
R4	TD2-	L2	OLED-
R7	TD3+	G3	GND
R8	TD3-	G4	GND
R9	TD4+		
R10	TD4-		
G1	GND		
G2	GND		



SPEED LED: (Lift)	ACTIVE LED: (Right)
GREEN: 1000Mbps	ORANGE (BLINKING): ACTIVITY
ORANGE: 100Mbps	No Light: NOT LINK
No Light: 10Mbps	ORANGE (NO BLINKING): LINK

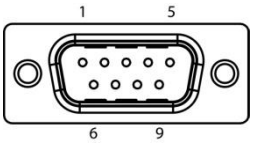
DVI: DVI-I connector

Pin	Definition	Pin	Definition
1	TMDS Data2-	16	Hot Plug Detect
2	TMDS Data2+	17	TMDS Data0-
3	TMDS Data2/4 Shield	18	TMDS Data0+
4	TMDS Data4-	19	TMDS Data0/5 Shield
5	TMDS Data4+	20	TMDS Data5-
6	DDC Clock	21	TMDS Data5+
7	DDC Data	22	TMDS Clock Shield
8	Analog Vert. Sync	23	TMDS Clock+
9	TMDS Data1-	24	TMDS Clock-
10	TMDS Data1+	C1	Analog Red
11	TMDS Data1/3 Shield	C2	Analog Green
12	TMDS Data3-	C3	Analog Blue
13	TMDS Data3+	C4	Analog Horiz. Sync
14	+5V Power	C5	Analog GND
15	GND		



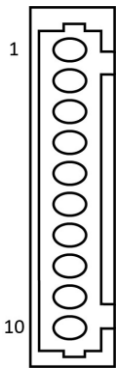
COM1: RS232/422/485 with +12V/+5V selection

Pin	RS-232	RS-422	Half Duplex RS-485
1	DCD	TX-	DATA-
2	RXD	RX+	NA
3	TXD	TX+	DATA+
4	DTR	RX-	NA
5	GND	GND	GND
6	DSR	NA	NA
7	RTS	NA	NA
8	CTS	NA	NA
9	+5V/+12V/RI	+5V/+12V/NA	+5V/+12V/NA



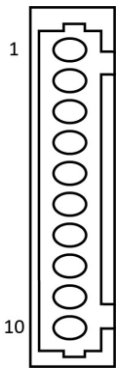
COM2, COM3, COM4: RS232 with +12V/+5V selection (1x10 pin Wafer)

Pin	Definition
1	+CM_P1 DCD
2	CM_DSR
3	CM_RXD
4	CM_RTS
5	CM_TXD
6	CM_CTS
7	CM_DTR
8	+CM2_P9 RI
9	GND
10	+5VIO



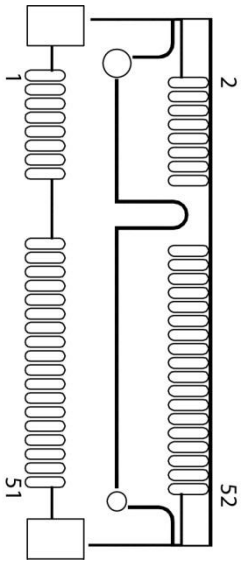
COM5: RS232

Pin	Definition
1	+CM_P1 DCD
2	CM_DSR
3	CM_RXD
4	CM_RTS
5	CM_TXD
6	CM_CTS
7	CM_DTR
8	+CM_P9 RI
9	GND
10	+5VIO



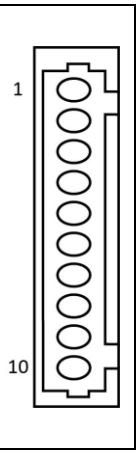
MPCIE1: Mini PCIE connector

Pin	Definition	Pin	Definition
1	WAKE#	2	+3.3V
3	Reserved	4	GND
5	Reserved	6	+1.5V
7	CLKREQ#	8	Reserved
9	GND	10	Reserved
11	REF CLK-	12	Reserved
13	REF CLK+	14	Reserved
15	GND	16	Reserved
17	Reserved	18	GND
19	Reserved	20	Reserved
21	GND	22	PERST#
23	PERN0	24	+3.3VAUX
25	PERP0	26	GND
27	GND	28	+1.5V
29	GND	30	SMB_CLK
31	PETN0	32	SMB_DATA
33	PETP0	34	GND
35	GND	36	USB_D-
37	Reserved	38	USB_D+
39	Reserved	40	GND
41	Reserved	42	LED_WWAN#
43	Reserved	44	LED_WLAN#
45	Reserved	46	LED_WPAN#
47	Reserved	48	+1.5V
49	Reserved	50	GND
51	Reserved	52	+3.3V



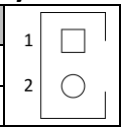
DEBUG: Debug card connector

Pin	Definition
1	DB_LPC_33M
2	RST_DB_R#
3	LFRAME#
4	LAD3
5	LAD2
6	LAD1
7	LAD0
8	+3.3V
9	GND
10	GND



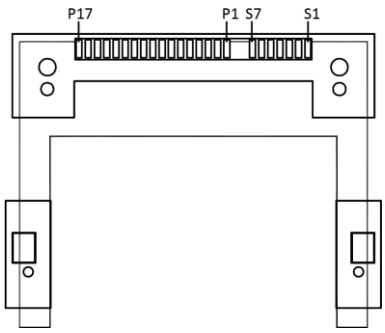
BAT1: RTC battery connector

Pin	Definition
1	+3V
2	GND



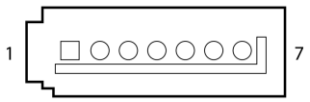
CFAST: CFAST connector

Pin	Segment	Definition
S1	SATA	GND
S2	SATA	A+
S3	SATA	A-
S4	SATA	GND
S5	SATA	B-
S6	SATA	B+
S7	SATA	GND
	Key	
	Key	
PC1	PWR/CTL	CDI
PC2	PWR/CTL	GND
PC3	PWR/CTL	TBD1
PC4	PWR/CTL	TBD2
PC5	PWR/CTL	TBD3
PC6	PWR/CTL	TBD4
PC7	PWR/CTL	GND
PC8	PWR/CTL	LED1
PC9	PWR/CTL	LED2
PC10	PWR/CTL	IO1
PC11	PWR/CTL	IO2
PC12	PWR/CTL	IO3
PC13	PWR/CTL	3.3V
PC14	PWR/CTL	3.3V
PC15	PWR/CTL	GND
PC16	PWR/CTL	GND
PC17	PWR/CTL	CDO



SATA1: Serial ATA 2.0 Connector

Pin	Definition
1	GND
2	TXP
3	TXN
4	GND
5	RXN
6	RXP
7	GND



Chapter 3: AMI BIOS UTILITY

This chapter provides users with detailed descriptions on how to set up a basic system configuration through the AMI BIOS setup utility.

3.1 Starting

To enter the setup screens, perform the following steps:

- Turn on the computer and press the <Del> key immediately.
- After the <Del> key is pressed, the main BIOS setup menu displays. Other setup screens can be accessed from the main BIOS setup menu, such as the Chipset and Power menus.

3.2 Navigation Keys

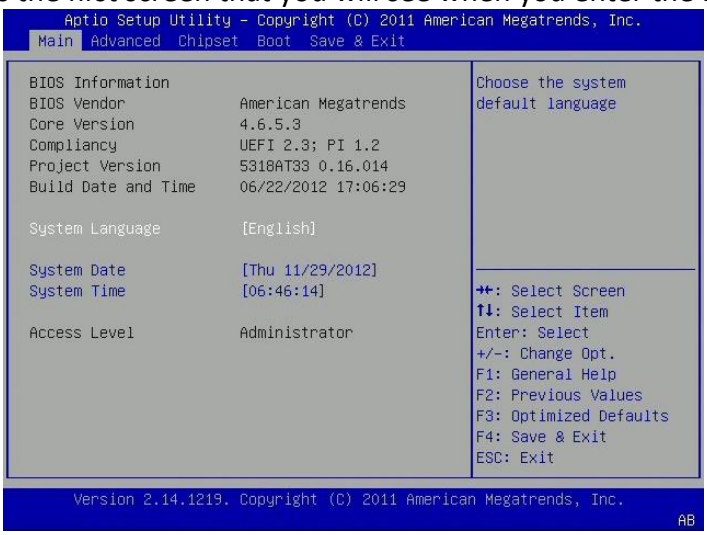
The BIOS setup/utility uses a key-based navigation system called hot keys. Most of the BIOS setup utility hot keys can be used at any time during the setup navigation process. Some of the hot keys are <F1>, <F10>, <Enter>, <ESC>, and <Arrow> keys.

Some of the navigation keys may differ from one screen to another.

Left/Right	The Left and Right <Arrow> keys moves the cursor to select a menu.
Up/Down	The Up and Down <Arrow> keys moves the cursor to select a setup screen or sub-screen.
+– Plus/Minus	The Plus and Minus <Arrow> keys changes the field value of a particular setup setting.
Tab	The <Tab> key selects the setup fields.
F1	The <F1> key displays the General Help screen.
F10	The <F10> key saves any changes made and exits the BIOS setup utility.
Esc	The <Esc> key discards any changes made and exits the BIOS setup utility.
Enter	The <Enter> key displays a sub-screen or changes a selected or highlighted option in each menu.

3.3 Main Menu

The Main menu is the first screen that you will see when you enter the BIOS Setup Utility.



System Language

Choose the system default language

System Date

Use this function to change the system date.

Select System Date using the Up and Down <Arrow> keys. Enter the new values through the keyboard. Press the Left and Right <Arrow> keys to move between fields.

The date setting must be entered in MM/DD/YY format.

System Time

Use this function to change the system time.

Select System Time using the Up and Down <Arrow> keys. Enter the new values through the keyboard. Press the Left and Right <Arrow> keys to move between fields.

The time setting is entered in HH:MM:SS format.

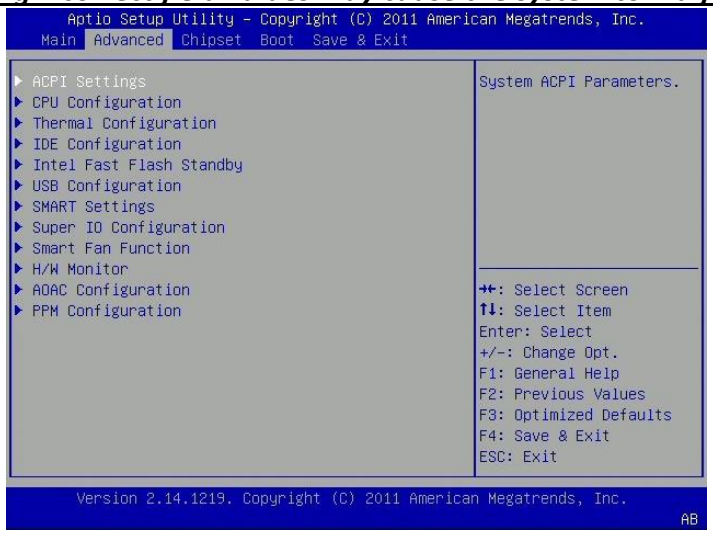
Note: The time is in 24-hour format. For example, 5:30 A.M. appears as 05:30:00, and 5:30 P.M. as 17:30:00.

Access Level

Displays the access level of the current user in the BIOS.

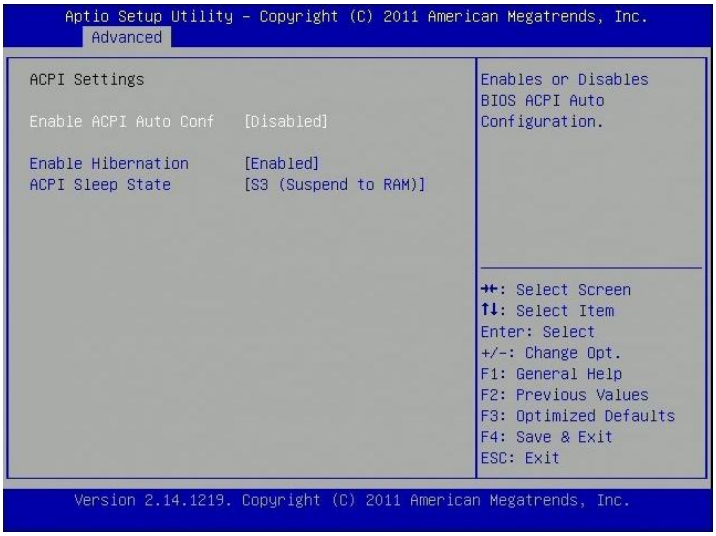
3.3 Advanced

The Advanced Menu allows you to configure your system for basic operation. Some entries are defaults required by the system board, while others, if enabled, will improve the performance of your system or let you set some features according to your preference. ***Setting incorrect field values may cause the system to malfunction.***



3.3.1 ACPI Settings

System ACPI parameters



Enable ACPI Auto Conf

Enables or disables BIOS ACPI auto configuration.

Enable Hibernation

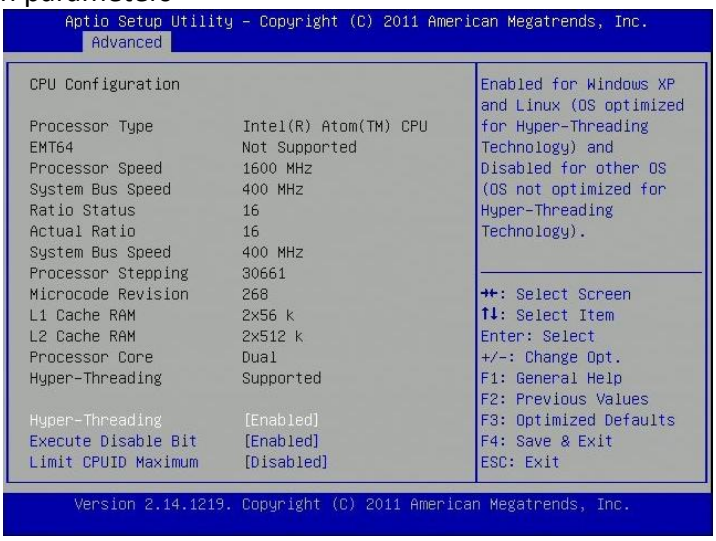
Enables or disables system ability to hibernate (OS/S4 Sleep State). This option may not be effective with some OS.

ACPI Sleep State

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

3.3.2 CPU Configuration

CPU configuration parameters



Hyper-Threading

Enabled for Windows XP and Linux (OS optimized for Hyper-Threading Technology) and Disabled for other OS (OS not optimized for Hyper-Threading Technology). When disabled only one thread per enabled core is enabled.

Execute Disable Bit

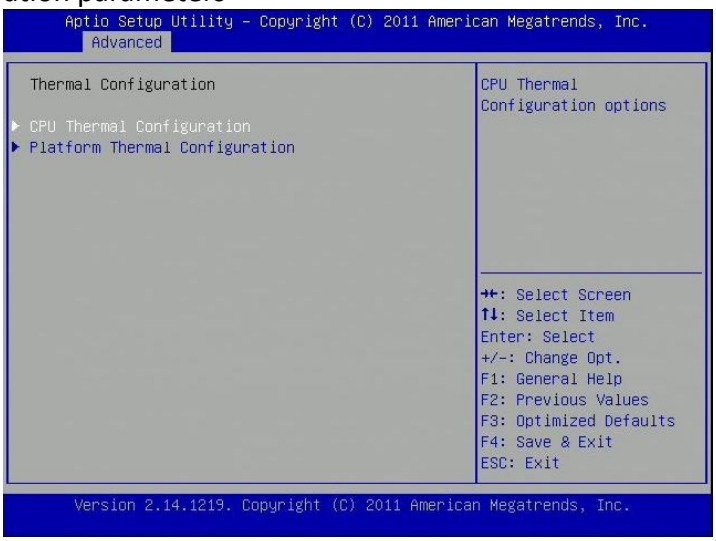
XD can prevent certain classes of malicious buffer overflow attacks when combined with a supporting OS (Windows Sever 2003 SP1, Windows XP SP2, SuSE Linux 9.2, RedHat Enterprise 3 Update 3.)

Limit CPUID Maximum

Disabled for Windows XP.

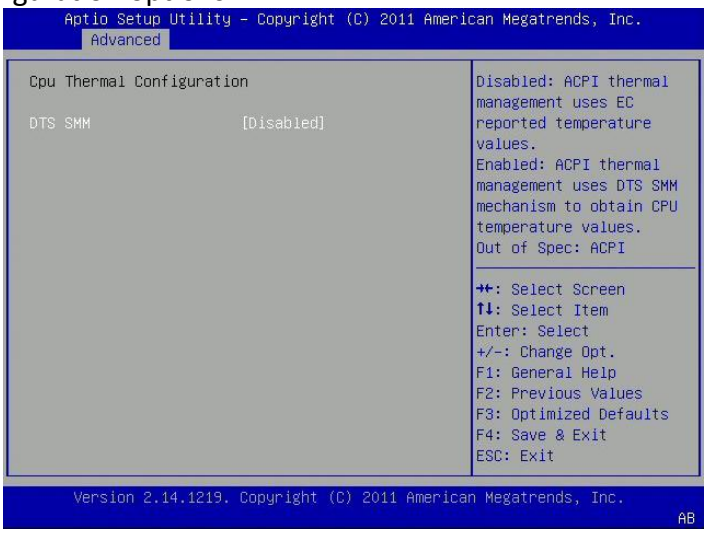
3.3.3 Thermal Configuration

Thermal configuration parameters



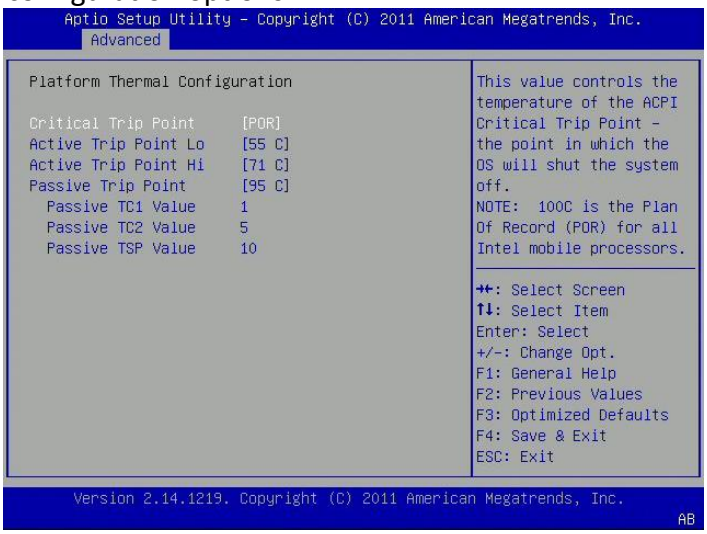
CPU Thermal Configuration

CPU thermal configuration options



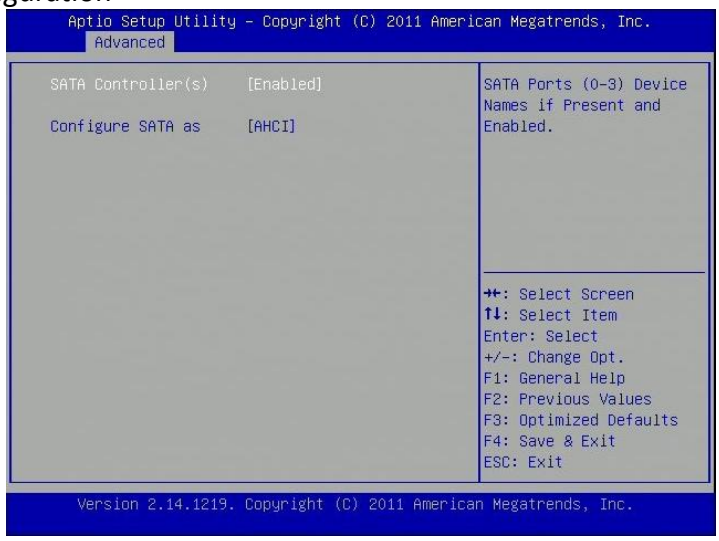
Platform Thermal Configuration

Platform thermal configuration options



3.3.4 IDE Configuration

IDE devices configuration



SATA Controller(S)

Enables or disables SATA ports.

Configure SATA As

IDE: This option configures the Serial ATA drives as Parallel ATA physical storage device.
RAID: This option allows you to create RAID or Intel Matrix Storage configuration on Serial ATA devices.
AHCI: This option configures the Serial ATA drives to use AHCI (Advanced Host Controller Interface). AHCI allows the storage driver to enable the advanced Serial ATA features which will increase storage performance.

3.3.5 Intel Fast Flash Standby

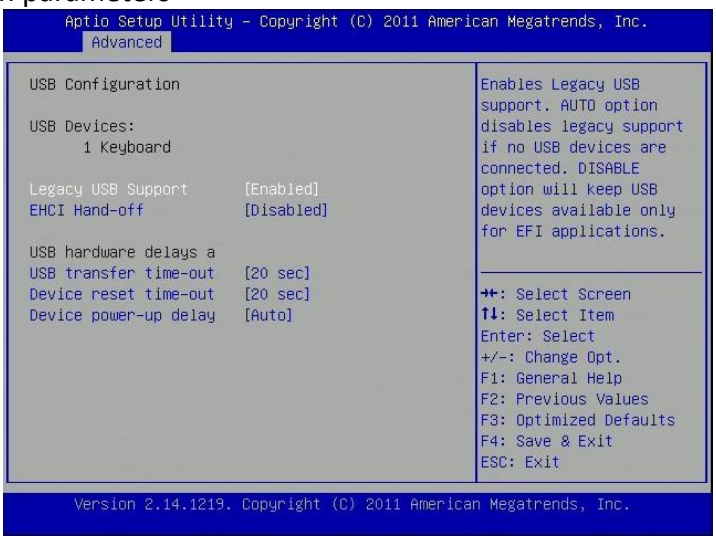
Intel Fast Flash Standby Technology configuration

iFFS Support

Enables or disables iFFS.

3.3.6 USB Configuration

USB configuration parameters



Legacy USB Support

Enables Legacy USB support.

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

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

EHCI Hand-Off

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

USB transfer time-out

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

USB reset time-out

USB mass storage device start unit command time-out

Device reset time-out

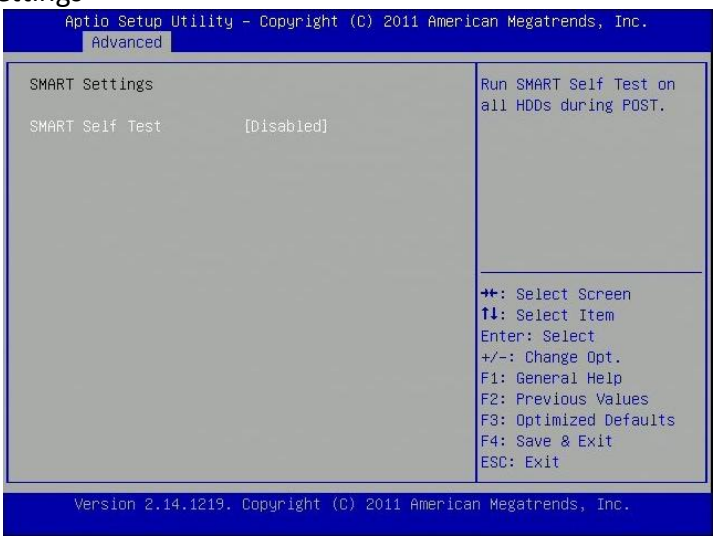
USB mass Storage device start Unit command time-out.

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 100ms, for a Hub port the delay is taken from Hub descriptor.

3.3.7 SMART Settings

System SMART settings

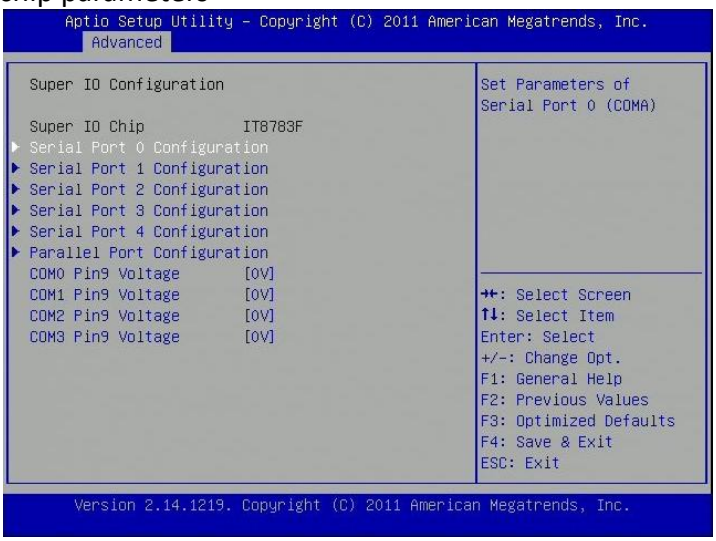


SMART Self Test

Run SMART Self Test on all HDDs during POST.

3.3.8 Super IO Configuration

System super IO chip parameters



Serial Port Configuration

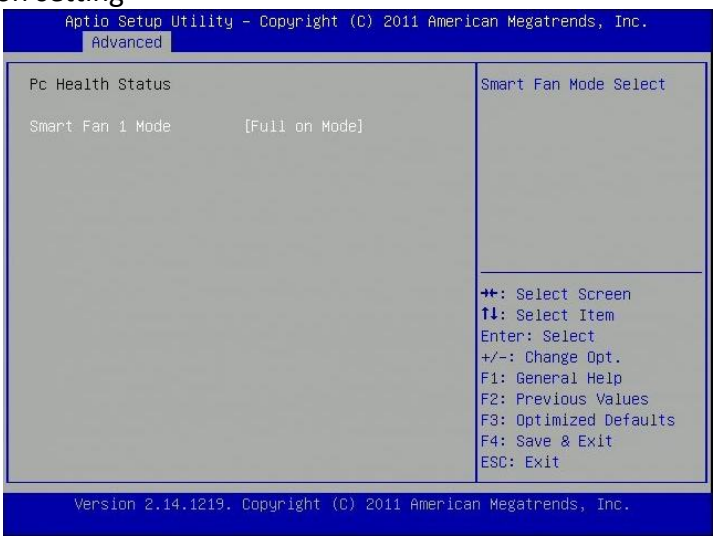
Set Parameters of Serial Ports. User can Enable/Disable the serial port and Select an optimal settings for the Super IO Device.

COM Pin9 Voltage

0V, 5V, 12V

3.3.9 Smart Fan Function

Smart Fan function setting

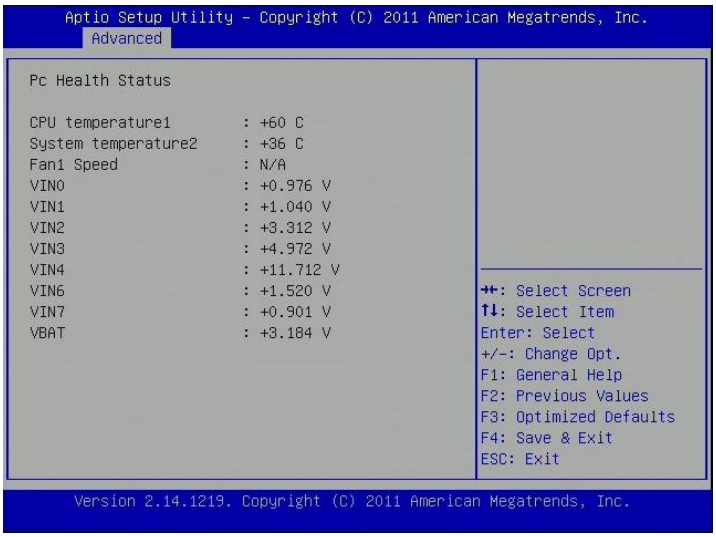


Smart Fan 1 Mode

Smart Fan Mode Select

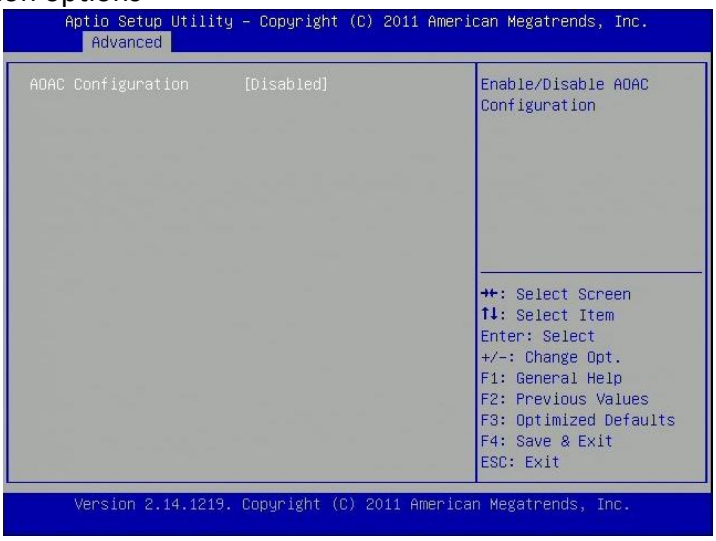
3.3.10 H/W Monitor

Monitor hardware status



3.3.11 AOAC Configuration

AOAC configuration options

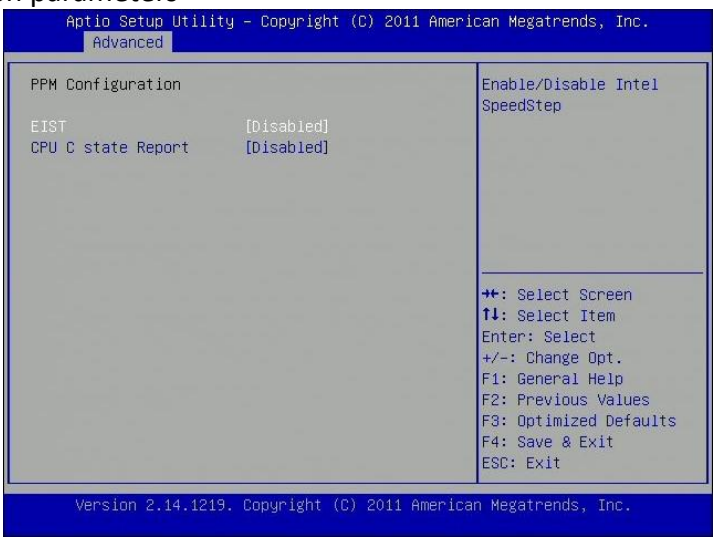


AOAC Configuration

Enable/Disable AOAC configuration

3.3.12 PPM Configuration

PPM configuration parameters



EIST

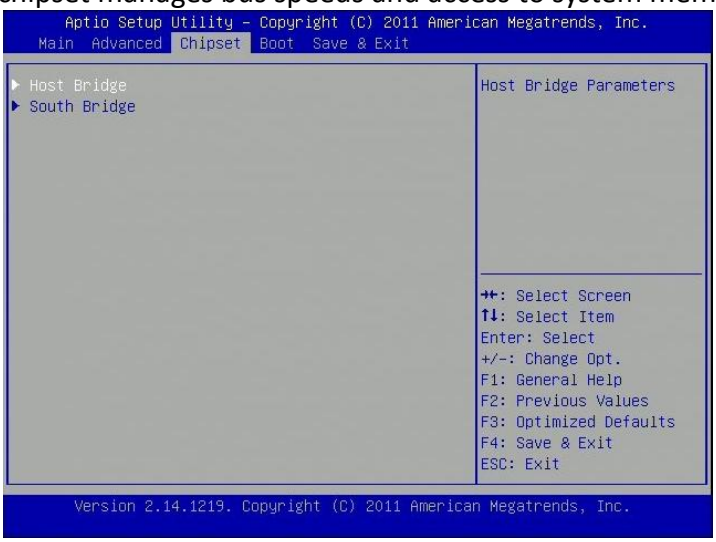
Enables or disables Intel SpeedStep.

CPU C state Report

Enabled or disabled CPU C state report to OS

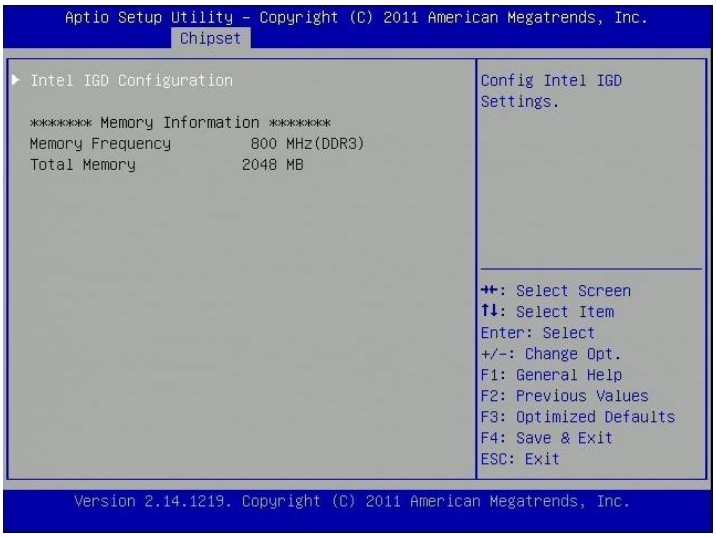
3.4 Chipset

This section gives you functions to configure the system based on the specific features of the chipset. The chipset manages bus speeds and access to system memory resources.



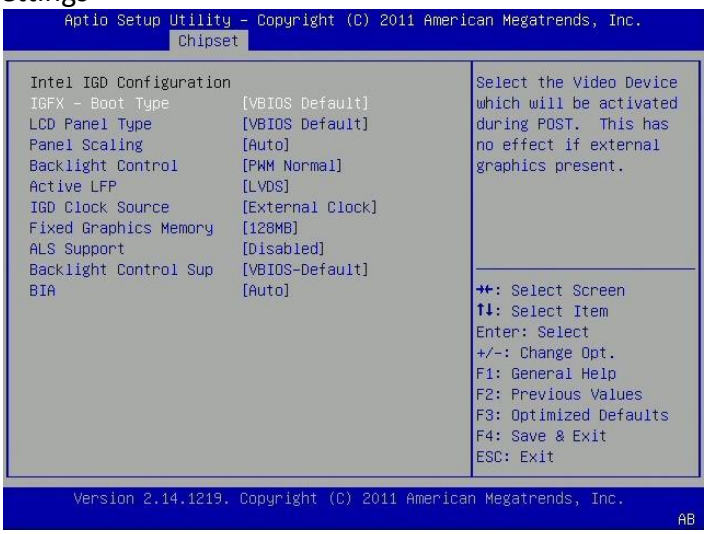
3.4.1 Host Bridge

Host Bridge parameters



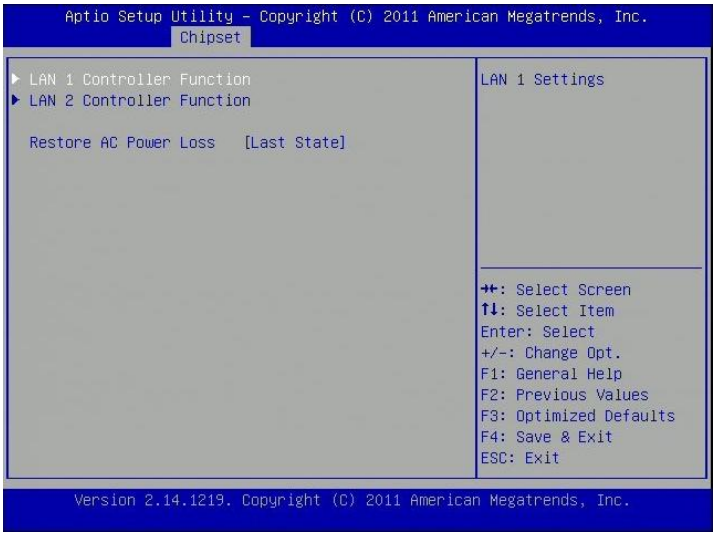
Intel IGD Configuration

Config Intel IGD settings



3.4.2 South Bridge

South Bridge parameters



LAN Controller Function

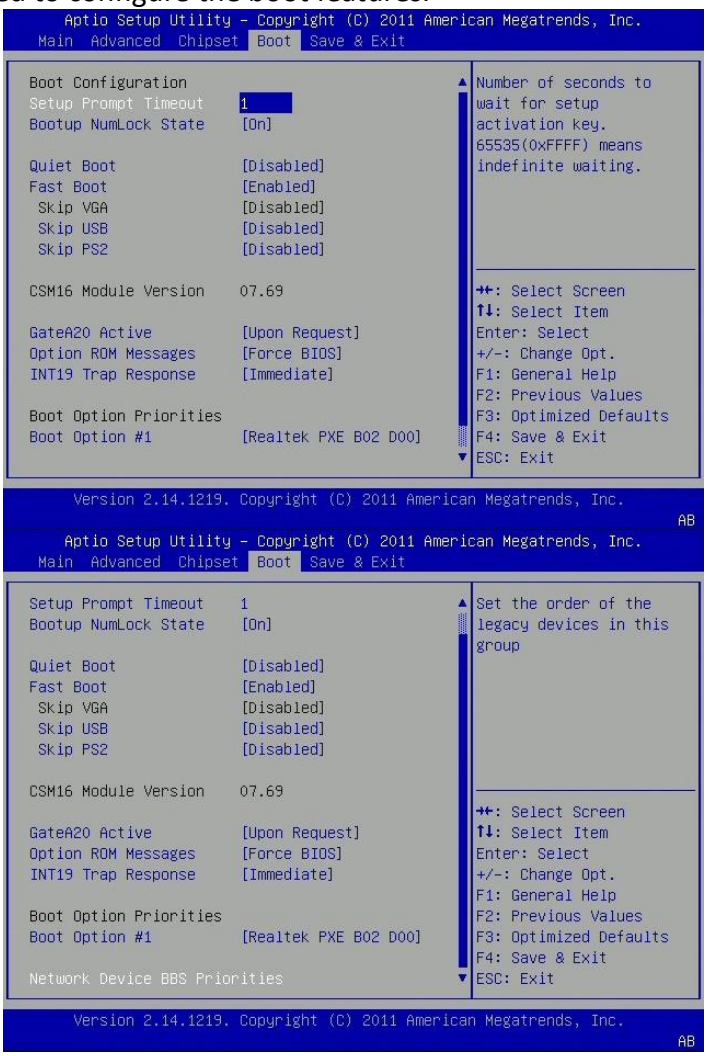
LAN settings

Restore AC Power Loss

Select AC power state when power is re-applied after a power failure.

3.5 Boot

This section is used to configure the boot features.



Setup Prompt Timeout

Number of seconds to wait for setup activation key. 65535(0xFFFF) means indefinite waiting.

Bootup NumLock State

Select the keyboard NumLock state.

Quite Boot

Enables or Disables Quiet Boot option.

Fast Boot

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

Skip USB

If enabled, USB devices will not be available until after OS boot. If disabled, USB device will be available before OS boot.

Skip PS2
If enabled, PS2 devices will be skipped.

GateA20 Active
UPON REQUEST – GA20 can be disabled using BIOS services.
ALWAYS – do not allow disabling GA20; this option is useful when any RT code is executed above 1MB.

Option ROM Messages
Set display mode for Option ROM.

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

Boot Option Priorities

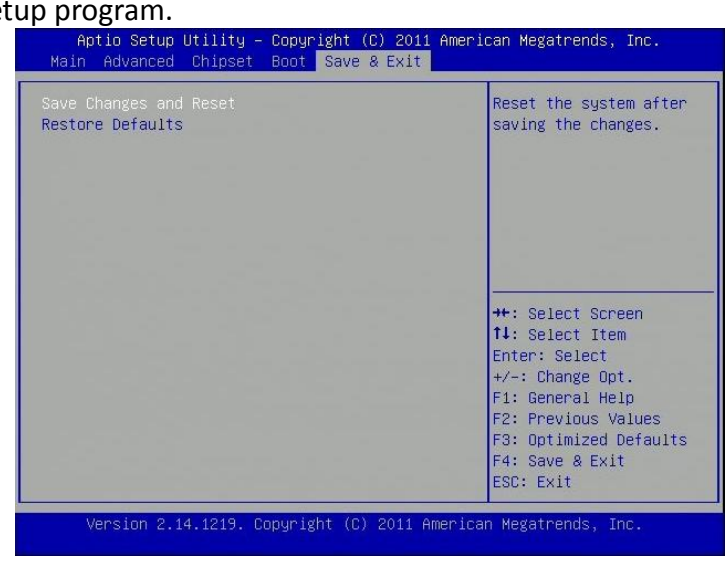
Boot Option #1

Sets the system boot order.

Network Device BBS Priorities
Set the order of the legacy devices in this group.

3.6 Save & Exit

This screen provides functions for handling changes made to the BIOS settings and the exiting of the Setup program.



Save Changes and Reset
Reset the system after saving the changes

Restore Defaults
Restore/Load default values for all the setup options.