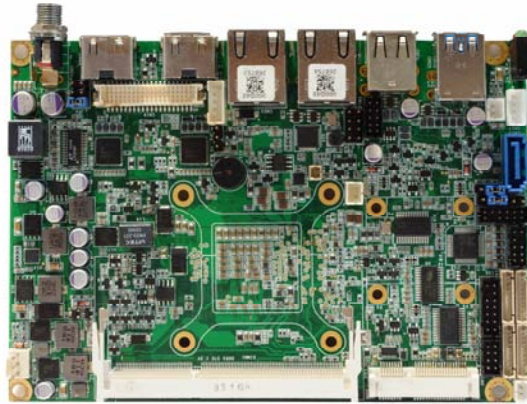


# User Manual



## **MB-80670 (SBC)**

3.5" SBC with Intel Broadwell i3/i5/i7 Series SoC, 2 HDMI, 2 GLAN, COM, USB, DC 8V~ 32V input

## **PL-80670 (Platform)**

3.5" Embedded System with Intel Broadwell i3/i5/i7 Series SoC, 2 HDMI, 2 GLAN, COM, USB, DC 8V~ 32V input

Ver.	Release Date	Update
1.0	2014.12	Release
1.1	2015.02	2.4.1 : CN1 for Power switch
1.2	2015.03	System information update.

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For technical support, please send your inquiry to [consultants@win-ent.com](mailto:consultants@win-ent.com).

## Packing list

Before using product make sure that the following materials have been shipped.


- ▶ 1 x MB-80670 3.5" SBC
- ▶ 1 x CPU cooling Fan ( P/N: ) CB-F00080-00
- ▶ 1 x SATA cable, L/ 200mm ( P/N: ) CB-SATA19-00
- ▶ 1 x COM cable (P/N: ) CB-ICOM34-01
- ▶ 1 x CD Utility

CB-F00080-00	CB-SATA19-00

Model Name	Description
PL-8067A	3.5" SBC with Intel® Core i3-5010U 2.1GHz, 2 HDMI, 2 GbE, COM, USB, DC 8V~ 32V input
PL-8067B	3.5" SBC with Intel® Core i5-5350U 2.9GHz, 2 HDMI, 2 GbE, COM, USB, DC 8V~ 32V input
PL-8067C	3.5" SBC with Intel® Core i7-5650U 3.2GHz, 2 HDMI, 2 GbE, COM, USB, DC 8V~ 32V input

\* If any of those items are missing or damaged contact sales representative or distributor.

Optional Accessory

Photo	Model Name	
	P/N:	CB-ICOM34-01
	Single COM port, DB9 type, L/ 180mm, without bracket	

## Safety Information

- 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 device 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 yourself. Contact a qualified service technician or your retailer.

## Operation Safety

- Before installing the motherboard and adding devices to it, carefully read all the manuals that came with the packages.
- Before using the product, make sure all cables are correctly connected and the power cables are not damaged. If you detect 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 technical problems with the product, contact a qualified service technician or your retailer.

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## Chapter 1. Generation Information

### 1.1 Introduction

**MB-80670 is built with next Generation Intel® Core™ SoC processor, Having one SO-DIMM DDR3L 1600MHz memory capacity and an integrated GT2/GT3 graphics; the MB-80670 is capable of providing a 24-bit dual-channel LVDS and two HDMI 1.4a display interface which supports 4k resolution display. As for I/O ports the MB-80670 provide plenty of connectivity, such as 2 x Intel® Gigabit Ethernet, 1 x RS-232/433/485 & 3 x RS-232, USB3.0, Audio, SATA 6Gb/s, 1 x LPC pin-header supporting WIN's TPM module. MB-80670 also comes with a lockable DC jack or a 4-pin internal power connector for easy power integration.**

MB-80670 that could accept wide range DC 8V ~ 32V input, a external DC locking power jack or a 4-pin internal power connector for easier power integration.

MB-80670 is a small form-factor embedded platform equipped with Intel® high performance GT2/GT3 Graphics and also rich IO ports, make MB-80670 suitable for a wide range of applications in digital signage, POS, kiosks, and factory automation. Fanless design are allowed for high temperature and dusty environments.

WIN offers reliable and solid products which are produced under Management System Standards: ISO9001-2000 Certificate. The certificate keeps us focused on our quality objectives of management and environmental protection. Its willingness to customize standard products for meet unique customer needs makes WIN different. All ODM projects are welcome. Years of experience enables WIN to fulfill the customer's vision, by delivering products to exact specifications. WIN R&D team is proud of its strong engineering background. R&D professionals account for 25% of the WIN workforce. We focus on developing new products for both emerging and established markets.

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Email: [consultants@win-ent.com](mailto:consultants@win-ent.com)

Tel: +1 (978) 688-2000



## 1.2 SBC Specifications

System	
From Factor	3.5" SBC
CPU	Intel Broadwell U SOC
Chipset	Integrated
Memory	1 x DDR3L SO-DIMM / 1600 MHz up to 8GB, w/o ECC support
BIOS	AMI SPI BIOS
SSD	1 x Half-size Mini-PCIe socket support mSATA SSD
Watchdog timer	255 levels, 1 ~ 255 sec
Expansion	1 x Full-size Mini-PCIe socket w/SIM slot. With PCIe X1 & USB signal 1 x Half-size Mini-PCIe socket. With PCIe X1 or SATA , USB signal
Board Size	146mm x 101mm
Operating Temp.	0°C~60°C (32°F~140°F)
Storage Temp.	-.20°C~80°C (-4°F~176°F)
Operating Hum.	10%~90% (non-condensing)

Display	
Chipset	Intel® integrated
Display interface	2 x external HDMI 1.4a ( PTN3360D level shift. Supports 4096 * 2304 @ 24 Hz resolution ) 1 x internal 24-bit Dual Channel LVDS (Chrontel CH7511. 1920*1080 resolution)

I/O	
Serial Ports	Internal: 1 x RS232/422/485 ( COM2 ), 3 x RS232 ( pitch : 2.0 )
SATA	1 x SATAIII-600
USB	External: 2 x USB3.0 + 2 x USB2.0 Internal: 2 x USB2.0 ( pitch: 2.0mm)
Ethernet	External: 1 x Intel I211AT + 1 x I218LM (IAMT 10)
Audio	Internal: Line-in/out, Mic-in (pitch : 2.0)
Digital I/O	8-bit GPIO interface (pitch: 2.0)
LPC	1 x LPC header for Optional TPM module (pitch: TBD)
Others	1 x CPU cooling Fan header (Smart fan support) 1 x Front Panel header for power on/off, reset, HDD/power LED indicator 1 x 2-pin header for battery, 1 x 4-pin DC out for SATA HDD 1 x LVDS Backlight/inverter pin-header

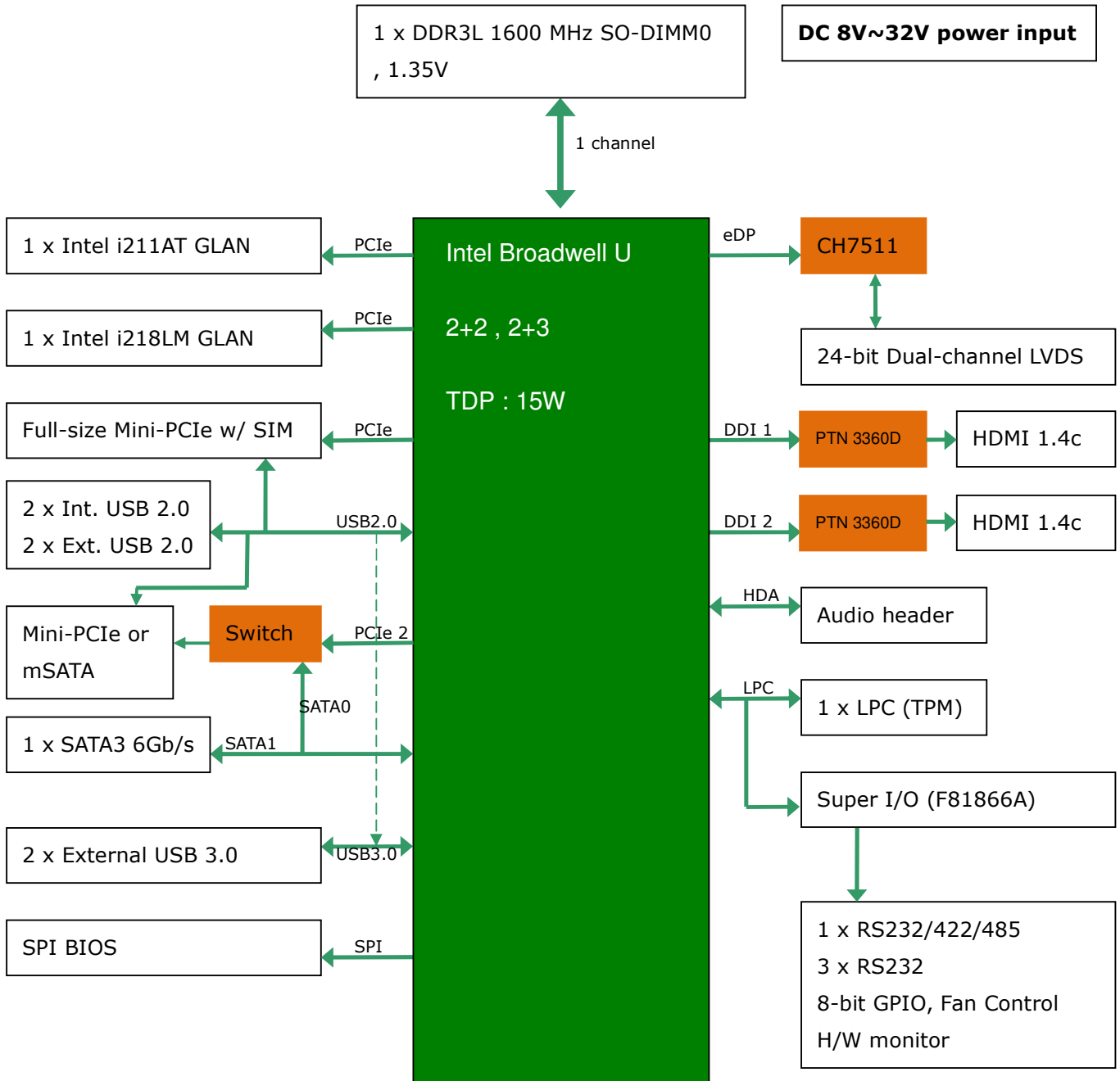


**Power**

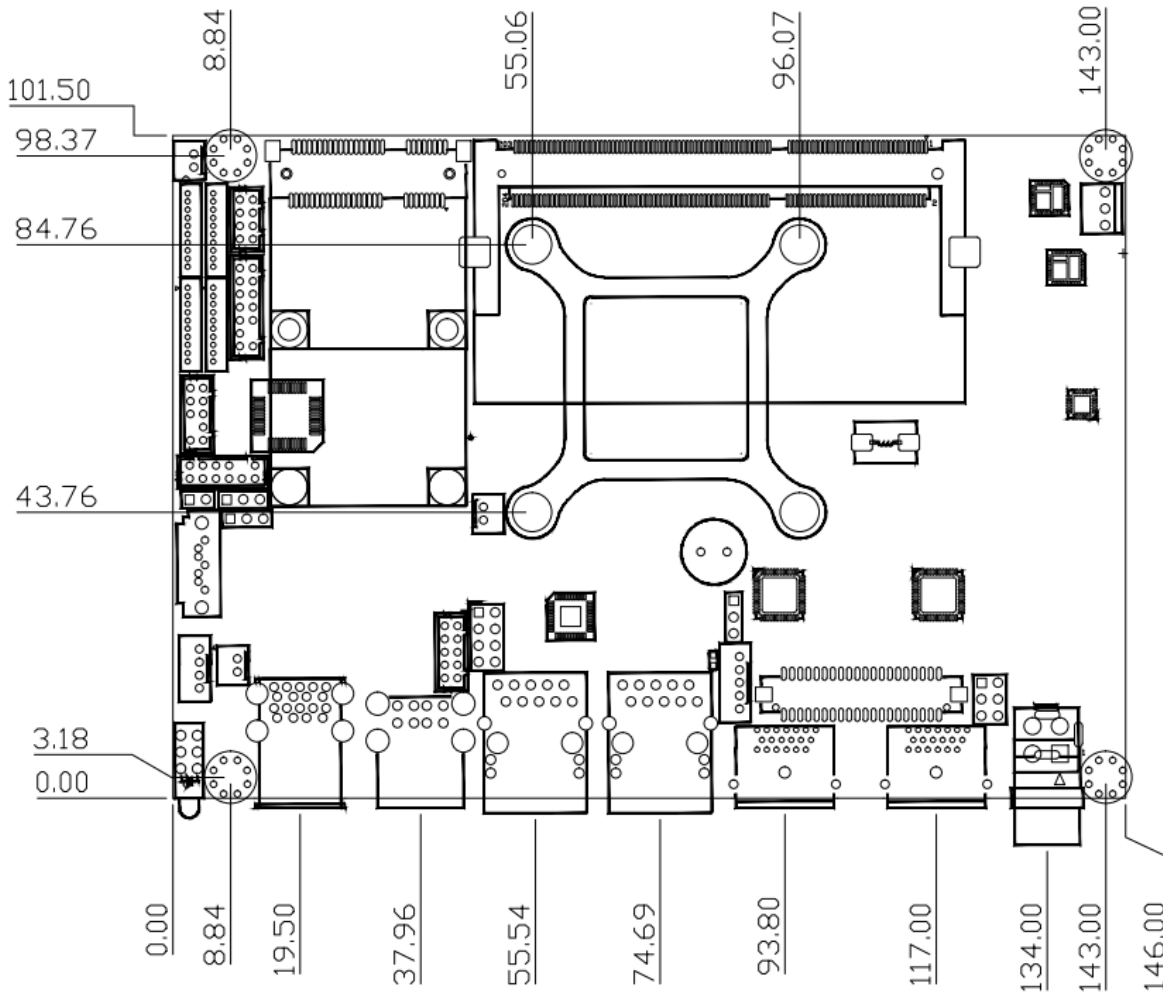
<b>Power in</b>	Single DC 8V ~ 32V input ( AT/ATX mode jumper selectable )
<b>Power connector</b>	1 x external Jack w/ lockable, Colay 1 x 4-pin internal header

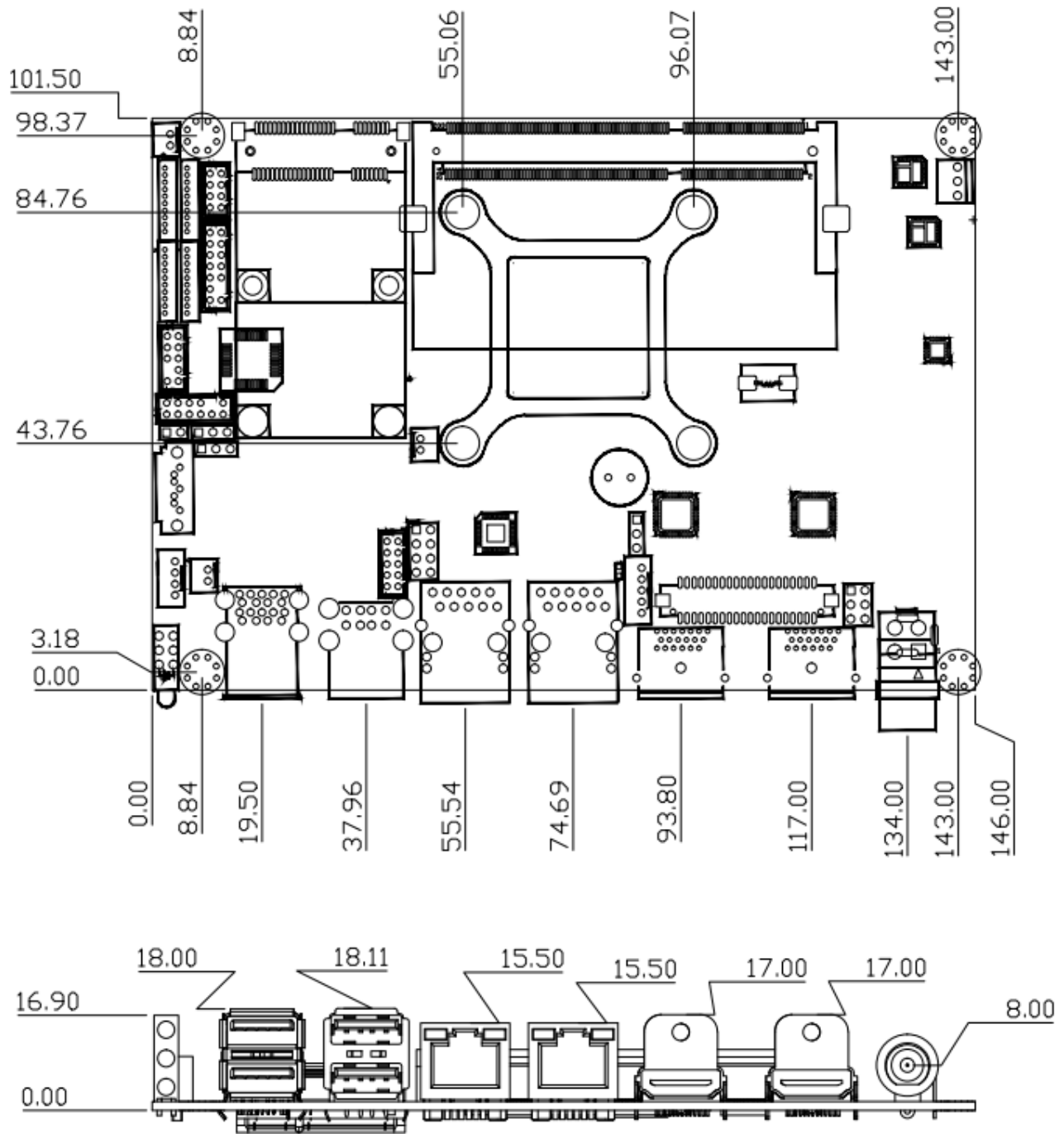
Note: Specifications and photos subject to change without prior notice.

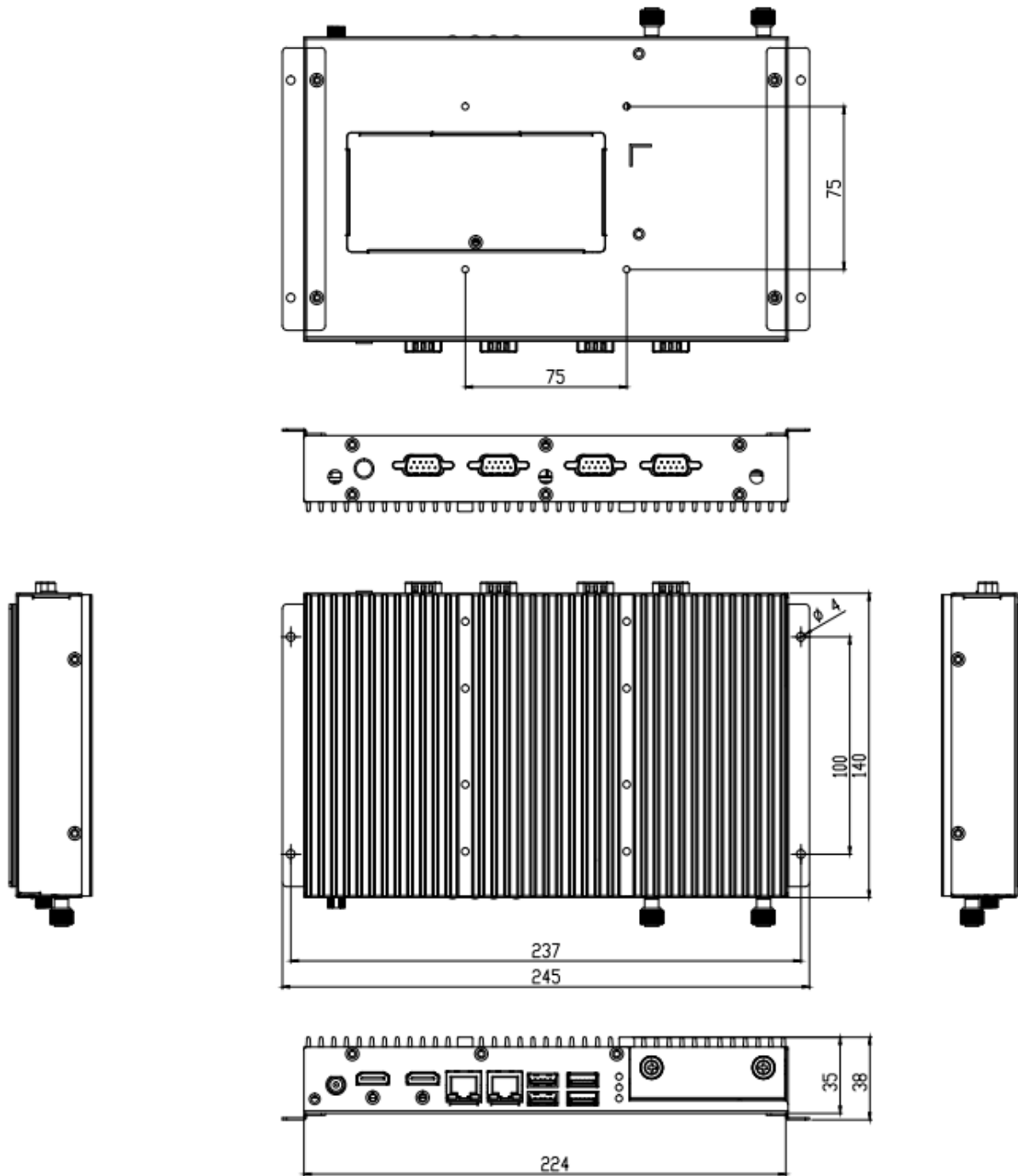
### 1.3 Block Diagram

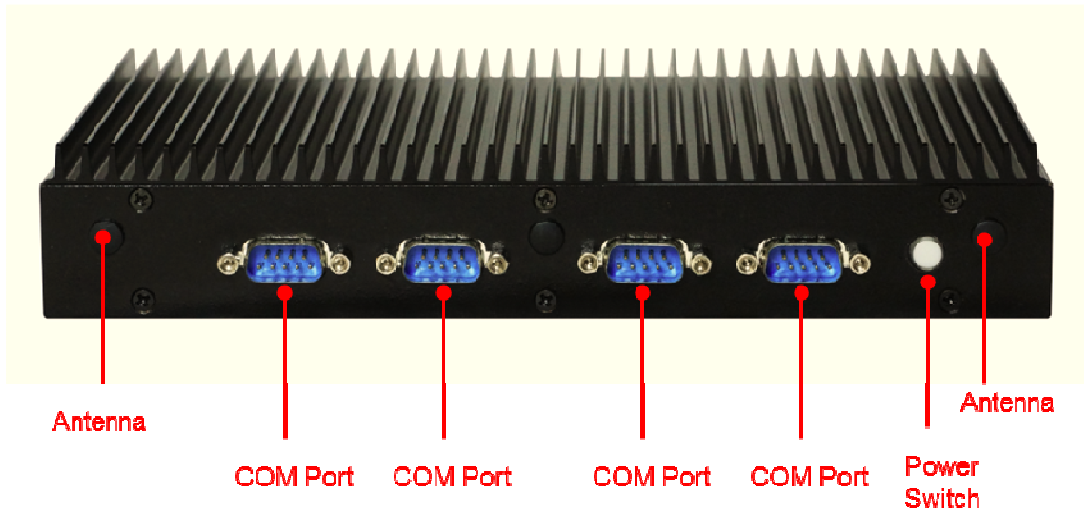
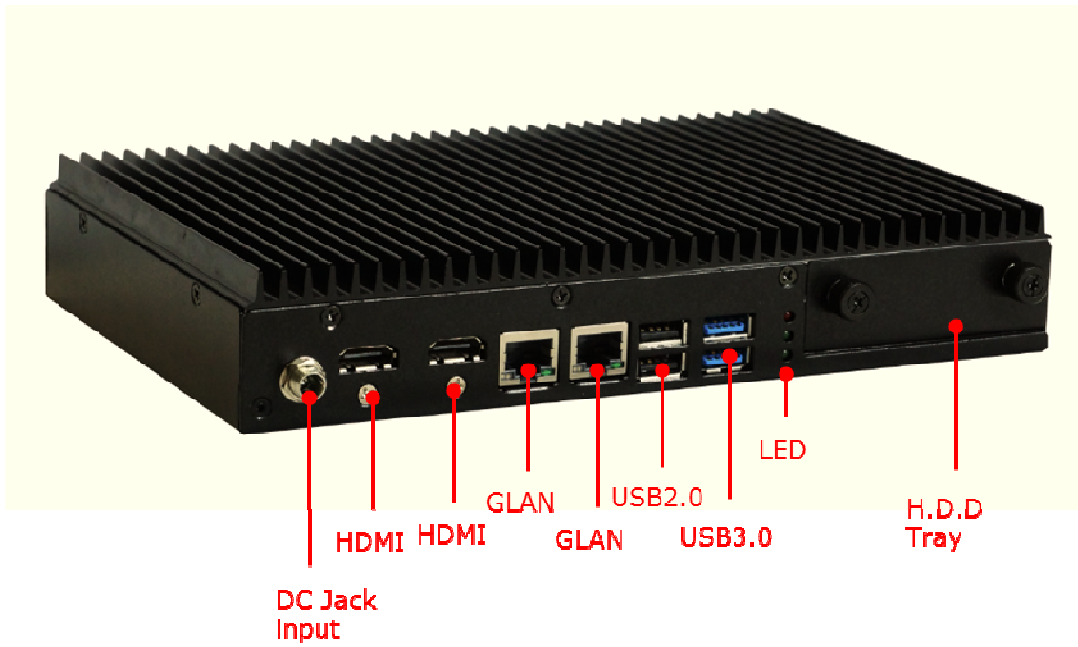


### 1.4 Board and System Layout/Dimensions

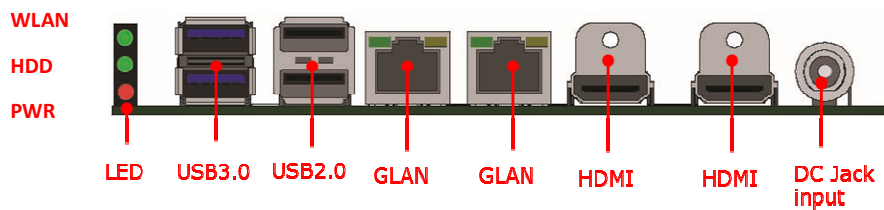
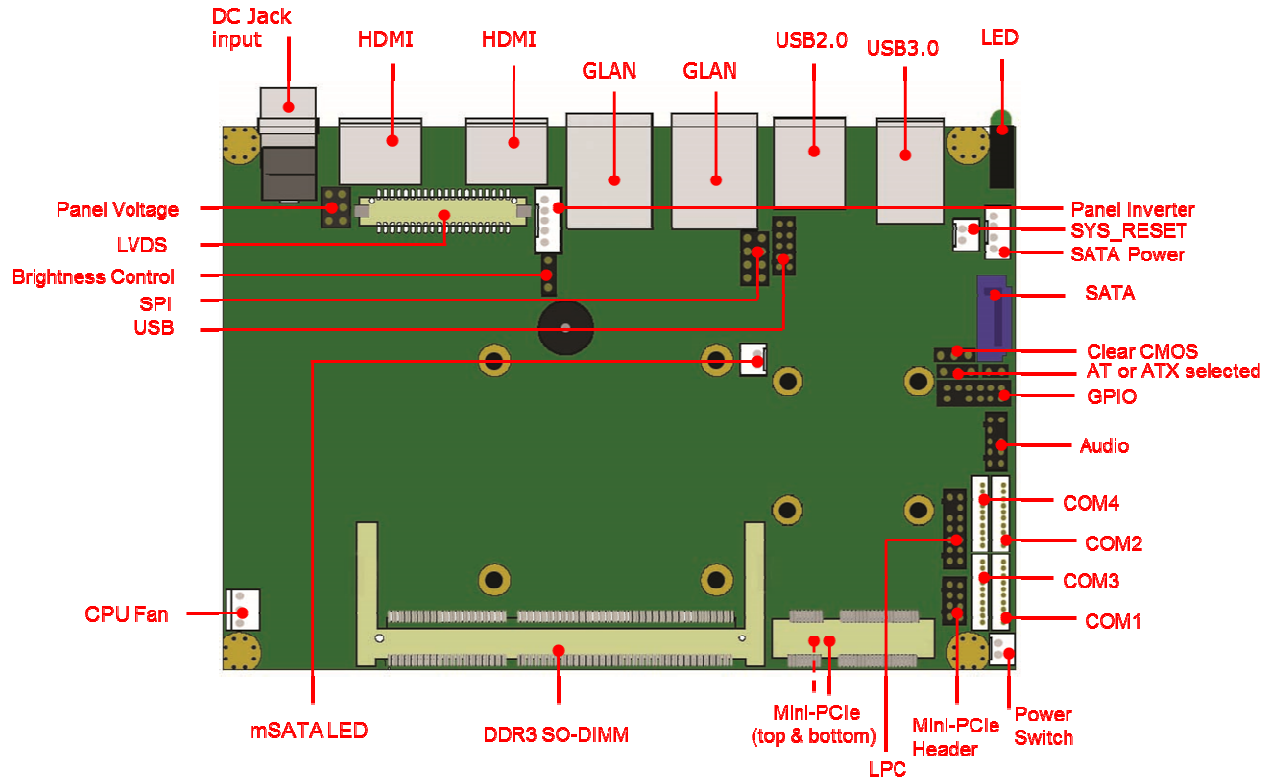








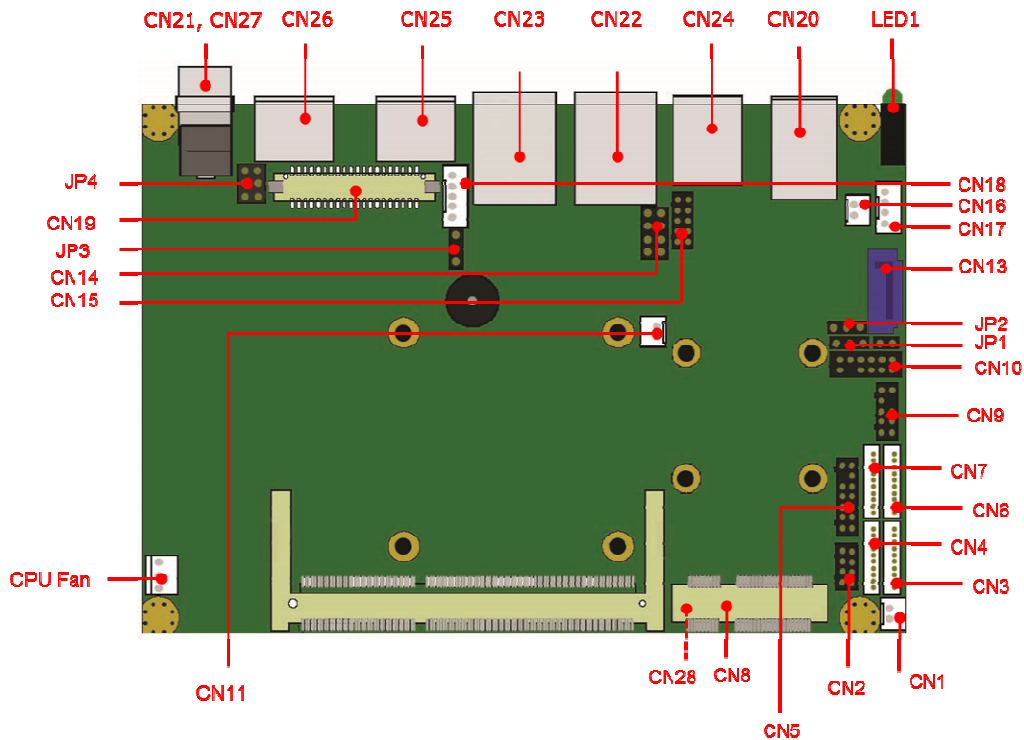
## 1.5 I/O ports





## 2 Hardware Installation

### 2.1 The location of onboard connectors

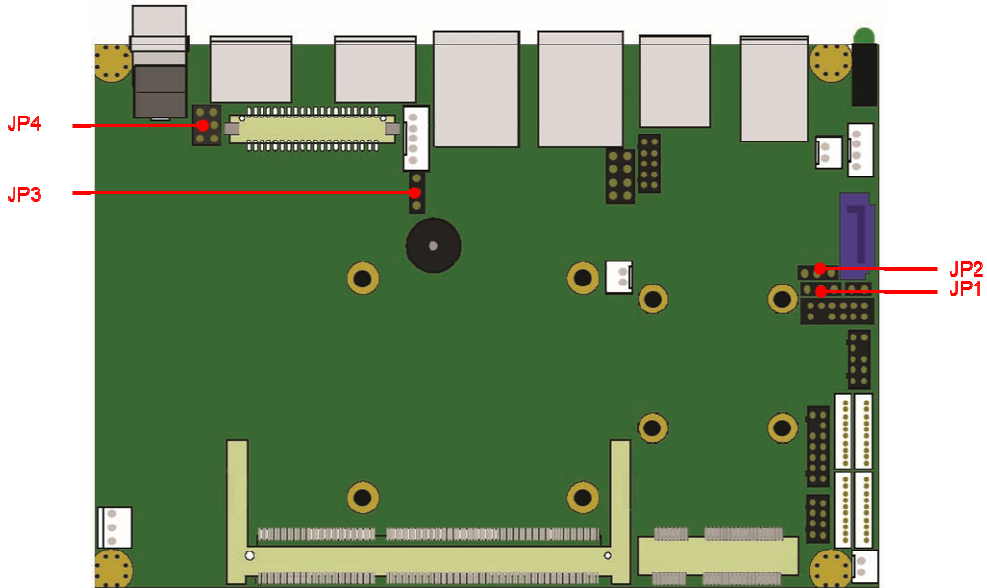


CN1	PWRSW PIN HEADER
CN2	SIM HOLDER PIN HEADER
CN3	COM1 PIN HEADER
CN4	COM3 PIN HEADER
CN5	LPC PIN HEADER
CN6	COM2 PIN HEADER
CN7	COM4 PIN HEADER
CN8	MINI PCIE SLOT
CN9	AUDIO PIN HEADER



CN10	GPIO PIN HEADER
CN11	LED PIN HEADER-MSATA
CN12	BAT_SOCKET(VARTA)
CN13	SATA CONNECTOR
CN14	SPI FLASH PIN HEADER
CN15	USB PIN HEADER
CN16	SYS_RESET PIN HEADER
CN17	SATA POWER CONNECTOR
CN18	PANNEL INVERTER CONNECTOR
CN19	LVDS CONNECTOR
CN20	USB 3.0 CONNECTOR
CN21&CN27	+VIN CONNECTOR
CN22	LAN1 RJ45 (I218)
CN23	LAN2 RJ45 (I211)
CN24	USB 2.0 CONNECTOR
CN25	HDMI CONNECTOR
CN26	HDMI CONNECTOR
LED1	LED
CPUFAN1	CPUFAN1
DIMM1	SODIMM

## 2.2 Location of onboard jumpers



JP1	AT or ATX selected
	1-2: ATX(Default)
	2-3: AT
JP2	CLEAR CMOS
	1-2: Normal (Default)
	2-3: Clear CMOS
JP3	Brightness Control
	1-2: PWM(Default)
	2-3: DC Level
JP4	Panel Voltage
	1-2: +3.3V(Default)
	3-4: +5.0V
	5-6 : +12V

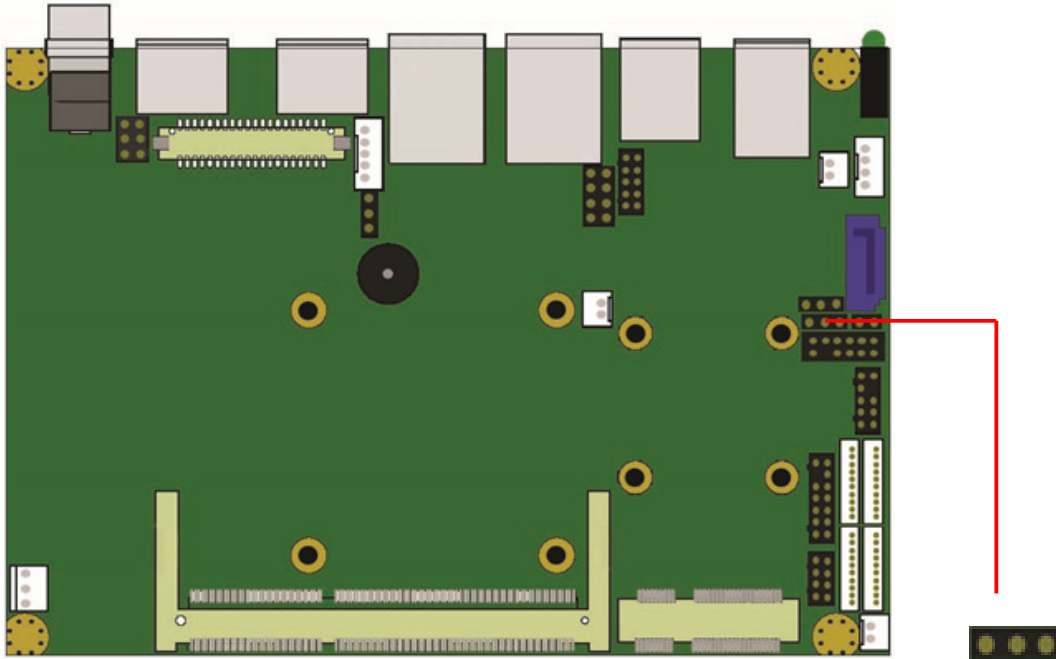
CN28(bot)	MINI PCIE
BZ1	BUZZER 1

## 2.3 Function list of onboard jumpers setting

### 2.3.1 : JP1 for AT/ATX mode select

JP1 : 1 x 3 header , pitch 2.0 mm	
Closed Pin	Result
1-2 *	ATX mode
2-3	AT mode

\* Default setting

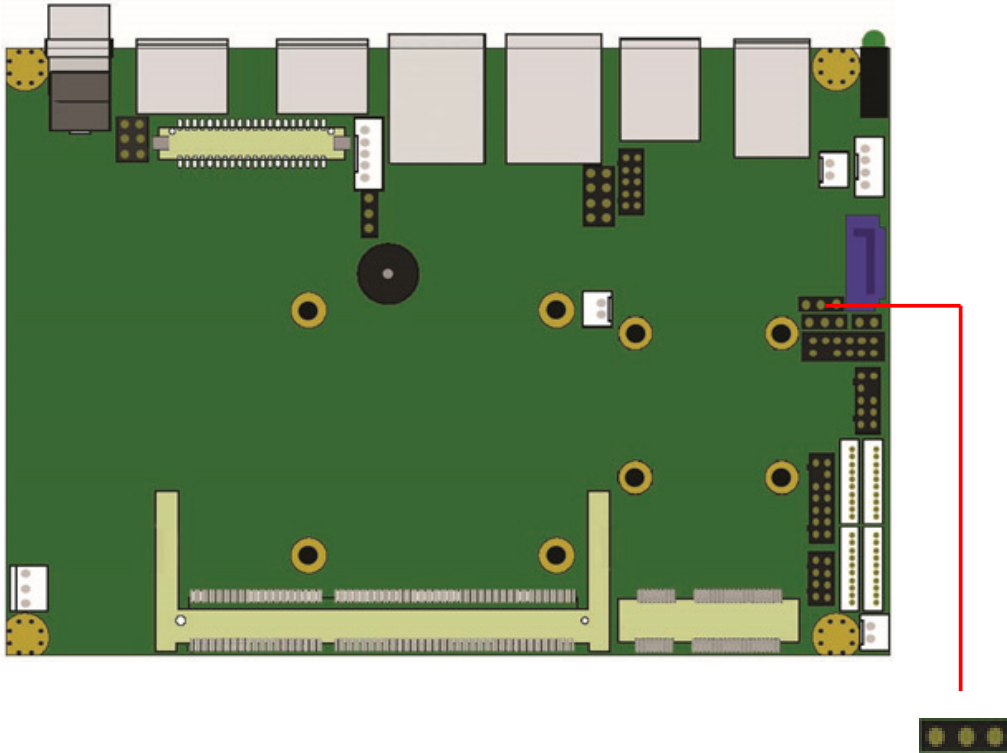


### 2.3.2: JP2 for Clear CMOS

If you want to clear the CMOS data, set jumper to 2-3 just for few seconds, then move the jumper back to 1-2 pin.

JP3 : 1 x 3 header , pitch 2.0 mm	
Closed Pin	Result
1-2 *	Normal
2-3	Clear CMOS

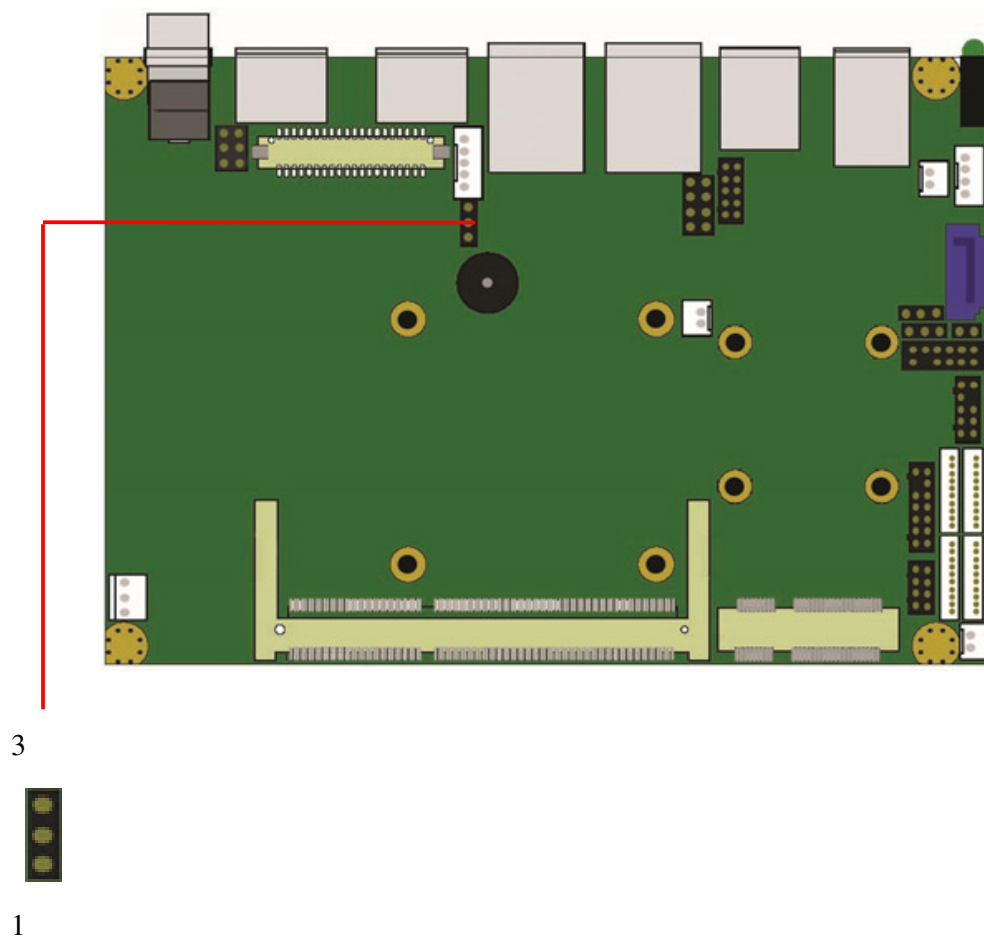
\* Default setting



### 2.3.3: JP3 for Brightness Control

JP3 : 1 x 3 header , pitch 2.0 mm	
Closed Pin	Result
1-2 *	PWM
2-3	DC Level

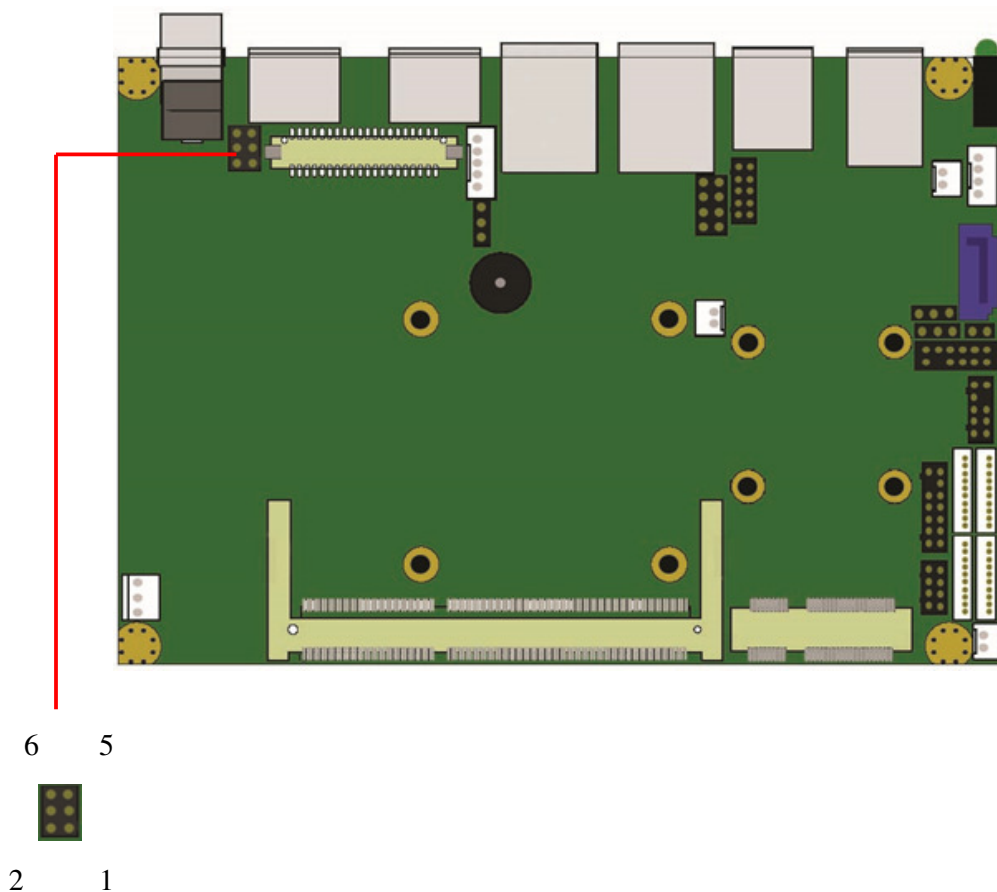
\* Default setting



### 2.3.4: JP4 for Panel Voltage selection

JP4: 1 x 3 header, pitch 2.0 mm	
Closed Pin	Panel Voltage
1-2 *	+3.3V(Default)
2-3	+5.0V
5-6	+12V

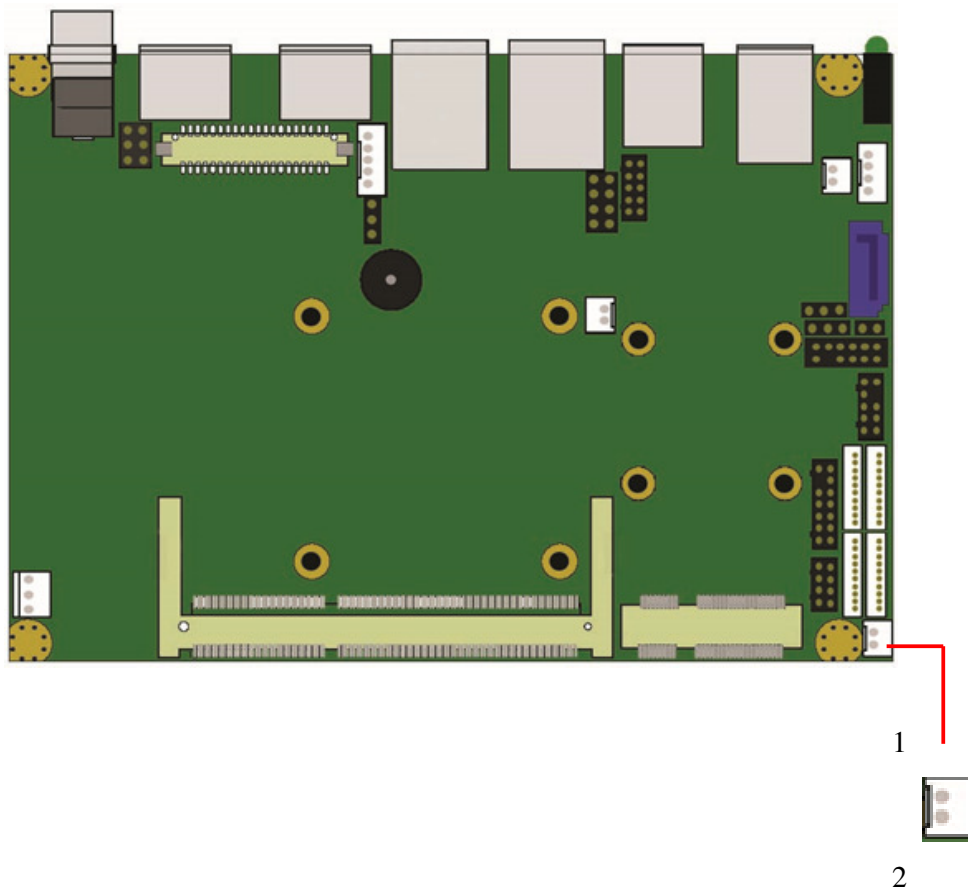
\* Default setting



## 2.4 Pin definitions for onboard pin headers

### 2.4.1: CN1 for Power switch

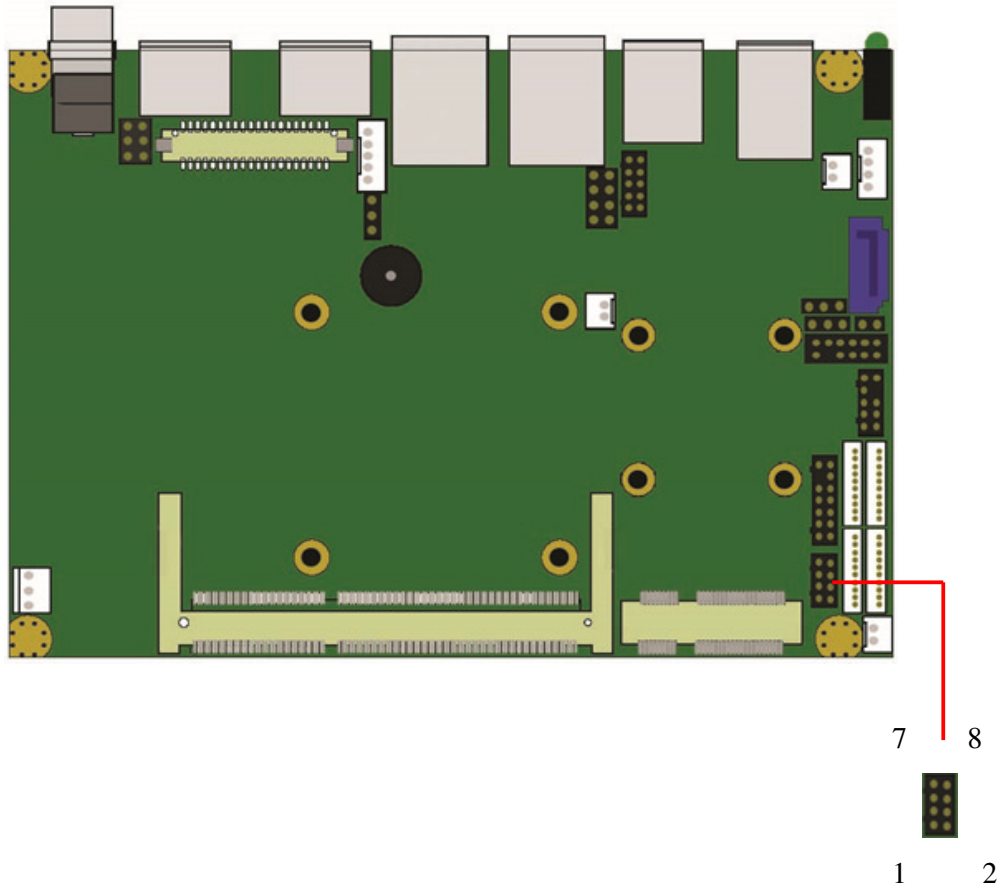
1 x 2 wafer			
Pin	Signal	Pin	Signal
1	GND	2	+3.3V





### 2.4.2: CN2 for SIM holder pin headers

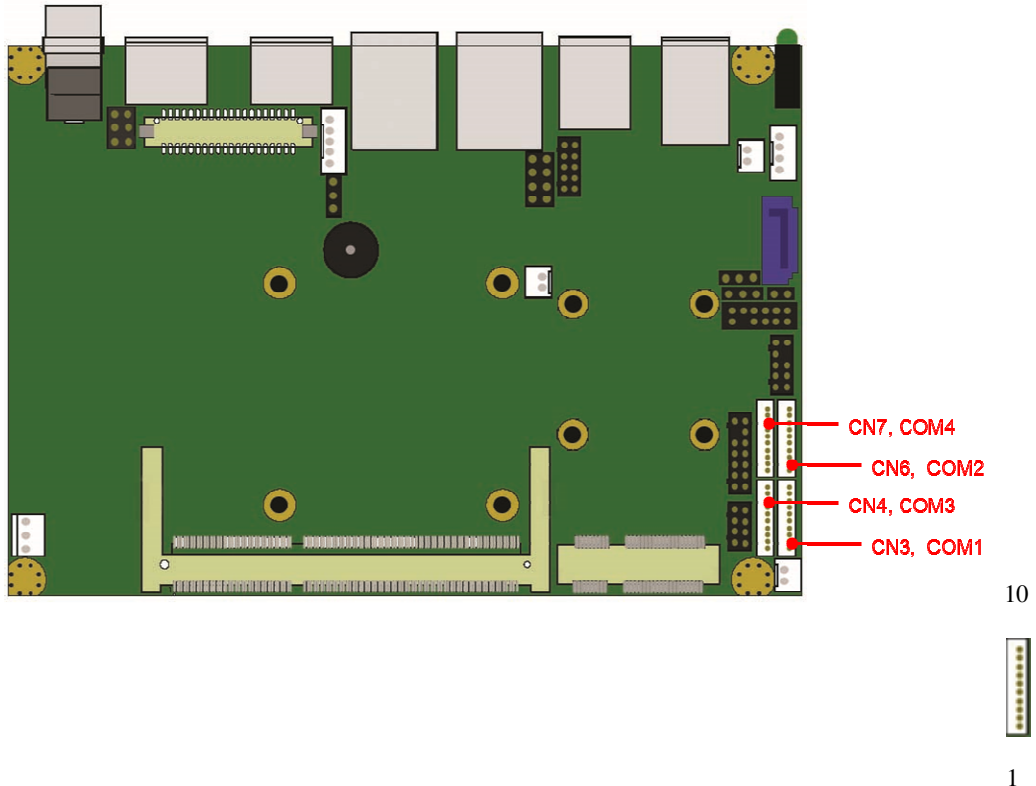
1 x 3 wafer			
Pin	Signal	Pin	Signal
1	SIM_PWR	2	GND
3	SIM_RESET	4	SIM_VPP
5	SIM_CLK	6	SIM_DATA
7	SIM_C4_R	8	SIM_C8_R



### 2.4.3: CN3, CN4, CN6, CN7 for COM1, COM3, COM2, COM4

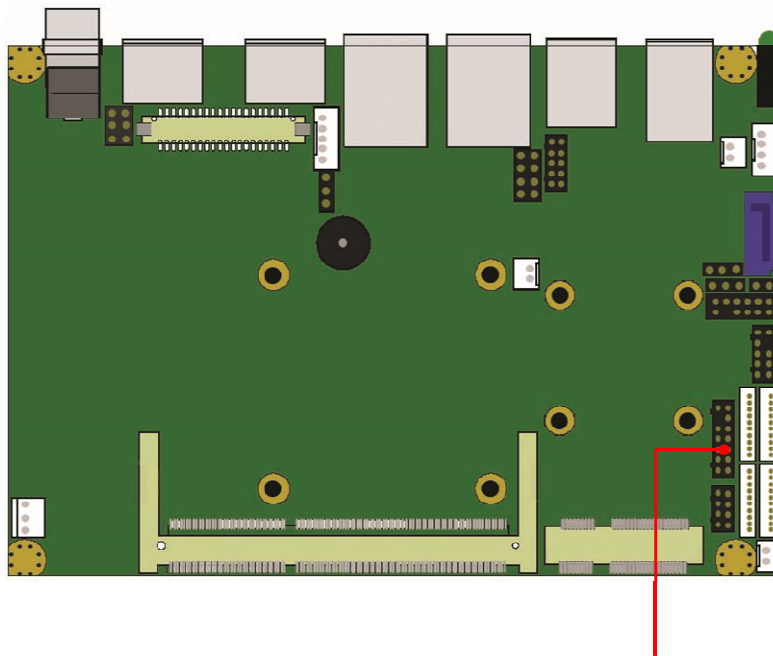
**Note:** COM2 RS-232/422/485 can be set with BIOS settings. Default is RS-232.

Wafer 1 x 10 header, pitch 1.25 mm, connector type : YIMTEX 501MW1*10STR			
Pin	RS232 mode(CN3, 4, 6, 7)	RS422 mode (CN6)	RS485 mode (CN6)
1	DCD, Data carrier detect	TXD-	TXD-
2	DSR, Data set ready		
3	RXD, Received Data	TXD+	TXD+
4	RTS, Request to send		
5	TXD, Transmitted Data	RXD+	
6	CTS, Clear to sent		
7	DTR, Data terminal ready	RXD-	
8	RI, Ring indicator		
9	GND		
10	N/C		

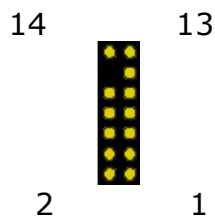


### 2.4.4: CN5 for Low Pin Count pin headers

2 x 7 header , pitch 2.0 mm			
Pin	Signal	Pin	Signal
1	+3.3V	2	LAD0
3	LAD1	4	LAD2
5	LAD3	6	LFRAME_N
7	PLTRST_N	8	+5V
9	LPC Clock	10	GND
11	GND	12	Key
13	SERIRQ	14	LPC_DREQ



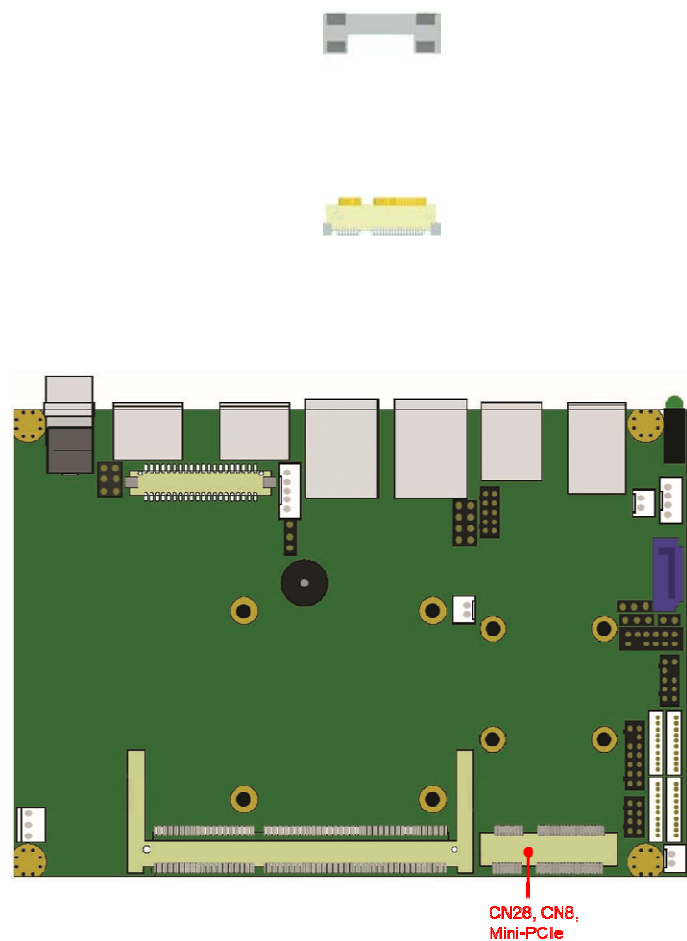
**Tip**  
**After installing a TPM remember to go to the BIOS menu to enable the module.**



### 2.4.5: CN8 for Full-size Mini-PCle socket

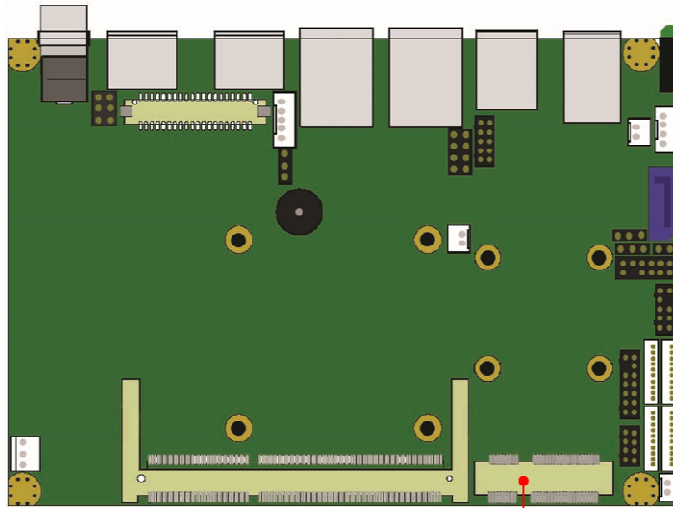
**Note:** Full-size Mini-PCIE only support PCIe + USB signal,  
Don't support SATA signal, such as mSATA SSD ...

Pin	Signal	Pin	Signal
1	WAKE	27	GND
2	+3.3V AUX	28	+1.5V
3	N/C	29	GND
4	GND	30	SMBCLK
5	N/C	31	PETN0
6	+1.5V	32	SMBDATA
7	CLKREQ	33	PETP0
8	UIM_PWR	34	GND
9	GND	35	GND
10	UIM_DATA	36	USB_D-
11	REFCLK-	37	GND
12	UIM_CLK	38	USB_D+
13	REFCLK+	39	+3.3V AUX
14	UIM_RESET	40	GND
15	GND	41	+3.3V AUX
16	UIM_VPP	42	LED_WWAN
17	UIM_C8	43	GND
18	GND	44	LED_WLAN
19	UIM_C4	45	N/C
20	W_Disable	46	N/C
21	GND	47	N/C
22	PERST	48	+1.5V
23	PERN0	49	N/C
24	+3.3V AUX	50	GND
25	PERP0	51	N/C
26	GND	52	+3.3V AUX



### 2.4.6: CN28 for half-size Mini-PCIe socket on bottom side

Half-size Mini-PCIe socket					
Pin	Signal	Pin	Signal	Pin	Signal
1	MSATA_WAKE	19	N/C	37	N/A
2	+3.3V	20	N/C	38	USB_D+
3	N/C	21	GND	39	V3P3_MSATA
4	GND	22	PLTRST_BUF1_N	40	GND
5	N/C	23	MSATA_RXN4	41	V3P3_MSATA
6	+1.5V	24	MSATA_AUX33	42	LED_WWAN
7	MCLKREQ	25	MSATA_RXP4	43	N/A
8	N/C	26	GND	44	LED_WLAN
9	GND	27	GND	45	N/A
10	N/C	28	+1.5V	46	LED_WPAN
11	MSATA_PE_CLKN	29	GND	47	N/A
12	N/C	30	ICH_SMBCLK	48	+1.5V
13	MSATA_PE_CLKP	31	MSATA_TXN4	49	N/A
14	N/C	32	ICH_SMBDATA	50	GND
15	GND	33	MSATA_TXP4	51	N/A
16	N/C	34	GND	52	+3.3V
17	N/C	35	GND	-	
18	N/C	36	USB_D-	-	



CN25, CN8,  
Mini-PCIe

**Note:** (Preliminary definition)

Half-size Mini-PCIe card could support SATA or PCIe signal.

The default setting is set as PCIe signal.

Please into BIOS and select SATA or PCIe signal to match your device.

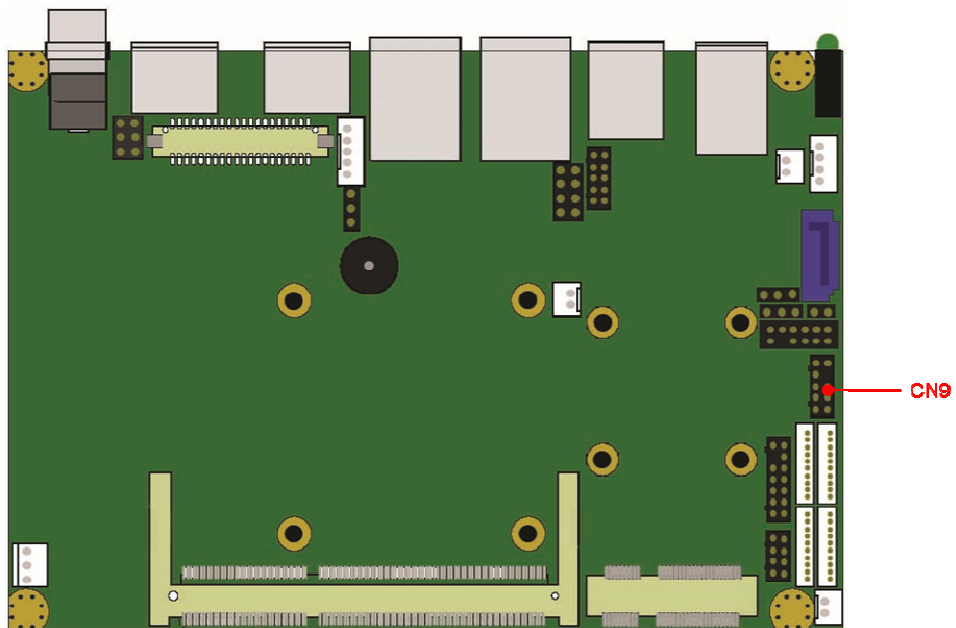
For example :

Go into BIOS and set "SATA" when you install a half-size, add-on card, such as mSATA SSD.

Go into BIOS and set "PCIe" when you install a half-size, add-on card, such as WiFi card.

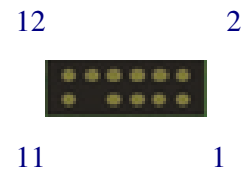
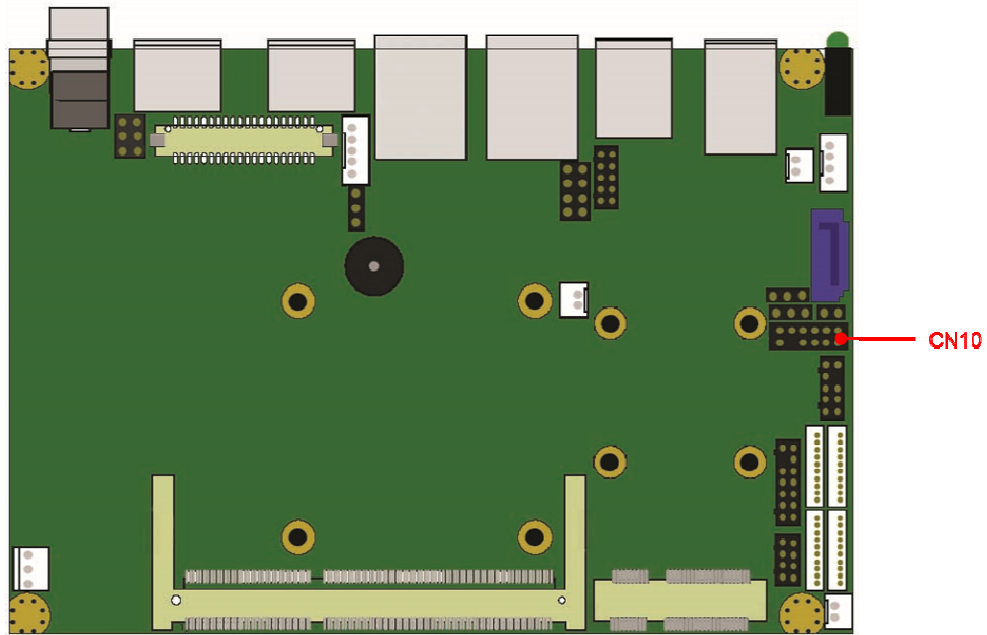
### 2.4.7: CN9 for Audio pin header

2 x 5 header , Pitch 2.0mm			
Pin	Signal	Pin	Signal
1	LINE1-R	2	LINE1-L
3	GND	4	GND
5	MIC1_R	6	MIC1_L
7	GND	8	Key
9	FRONT_R	10	FRONT_L



### 2.4.8 : CN10 for GPIO pin header

2 x 6 header , pitch 2.0 mm			
Pin	Signal	Pin	Signal
1	GPI0	2	+3.3V
3	GPI2	4	GPI1
5	GPO0	6	GPI3
7	GPO2	8	GPO1
9	Key	10	GPO3
11	GND	12	+5V

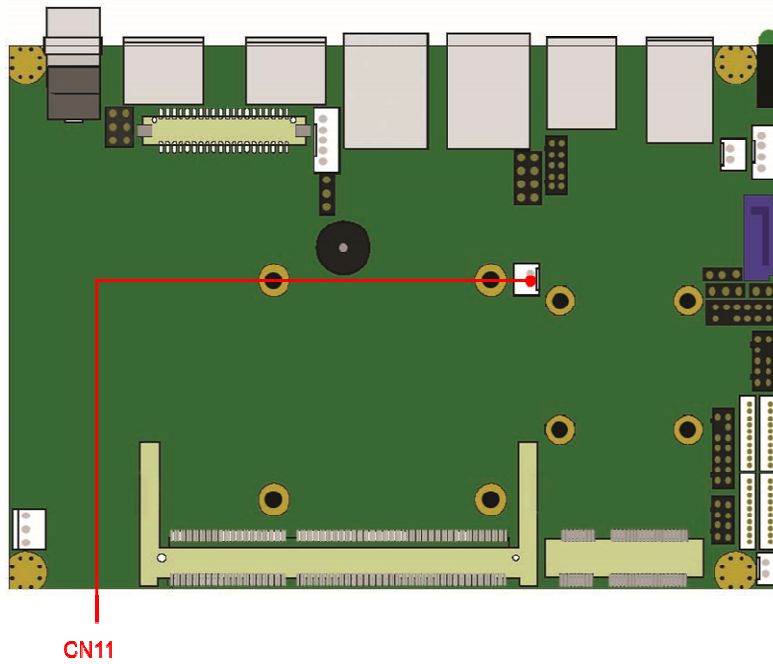




### 2.4.9: CN11 for mSATA LED (Half-size Mini-PCIe socket)

CN11 : 1 x 2 wafer			
Pin	Signal	Pin	Signal
1	LED-	2	+3.3V

**Note:** Supports wireless LAN signal only



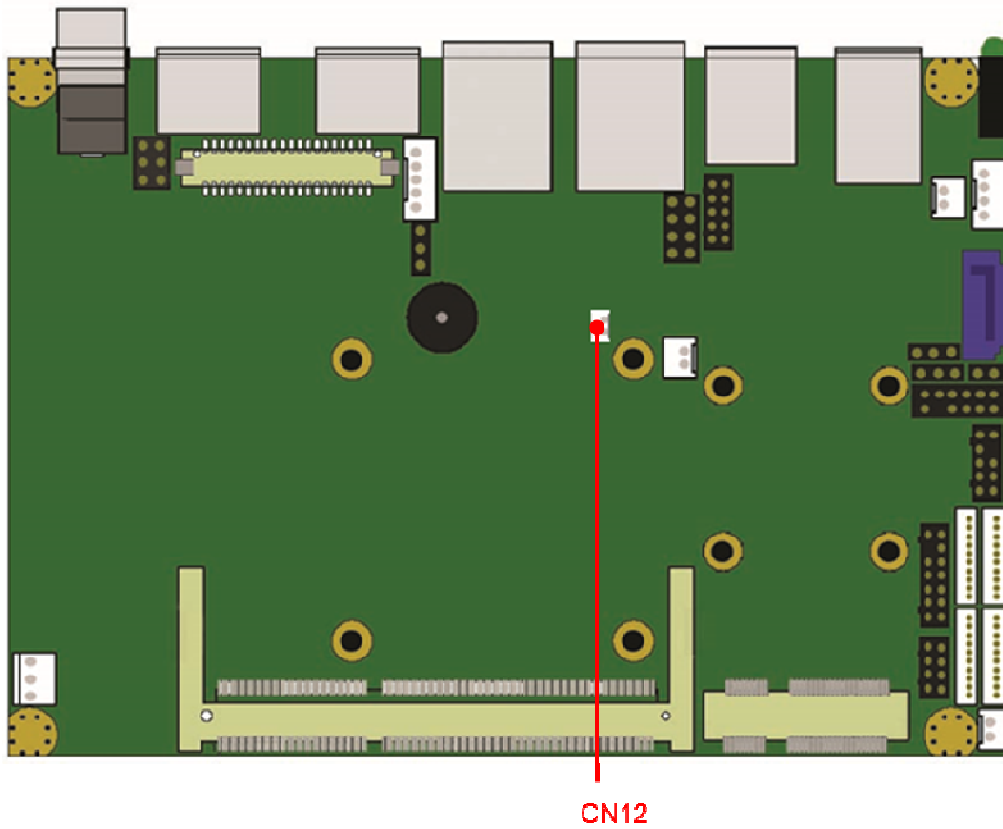
2



1

### 2.4.10: CN12 for Battery connector

1 x 2 header			
Pin	Signal	Pin	Signal
1	+3.3V	2	GND

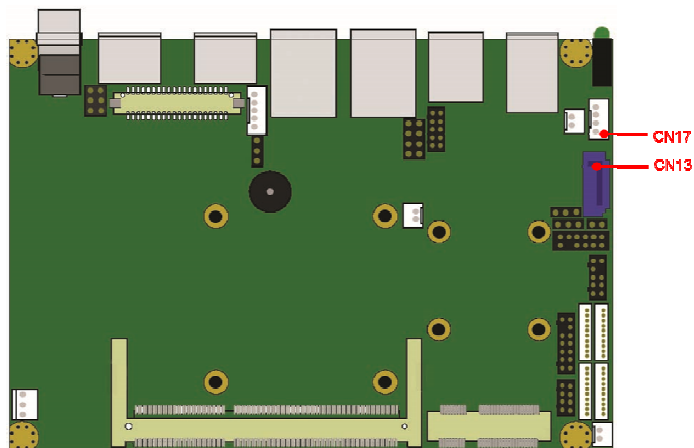


### 2.4.11: CN13 & CN17 for SATA 3.0 connector and SATA power connector

CN13 : SATA 3.0 connector			
Pin	Signal	Pin	Signal
1	GND	2	SATA_TX_P0
3	SATA_TX_N0	4	GND
5	SATA_RX_N0	6	SATA_RX_P0
7	GND		

CN17: 4-pin wafer for SATA power connector			
Pin	Signal	Pin	Signal
1	+12V	2	GND
3	GND	4	+5V

**Note:** Maximum output current 12V/1A, 5V/1A.



1



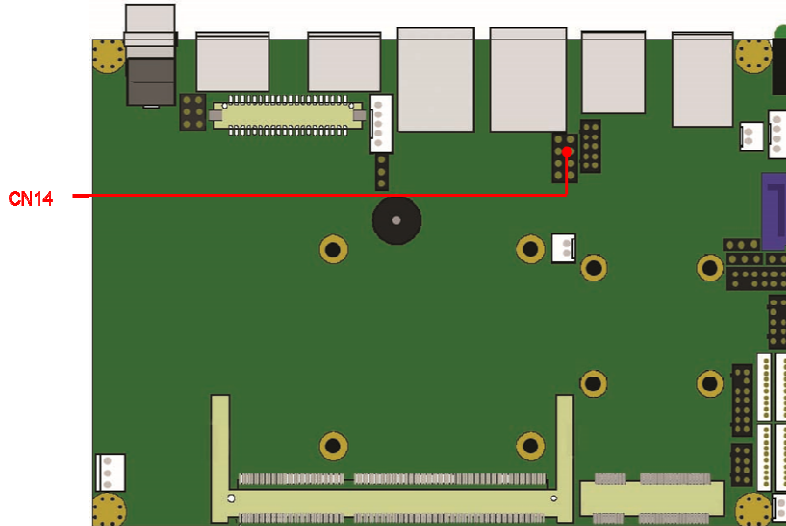
1



4

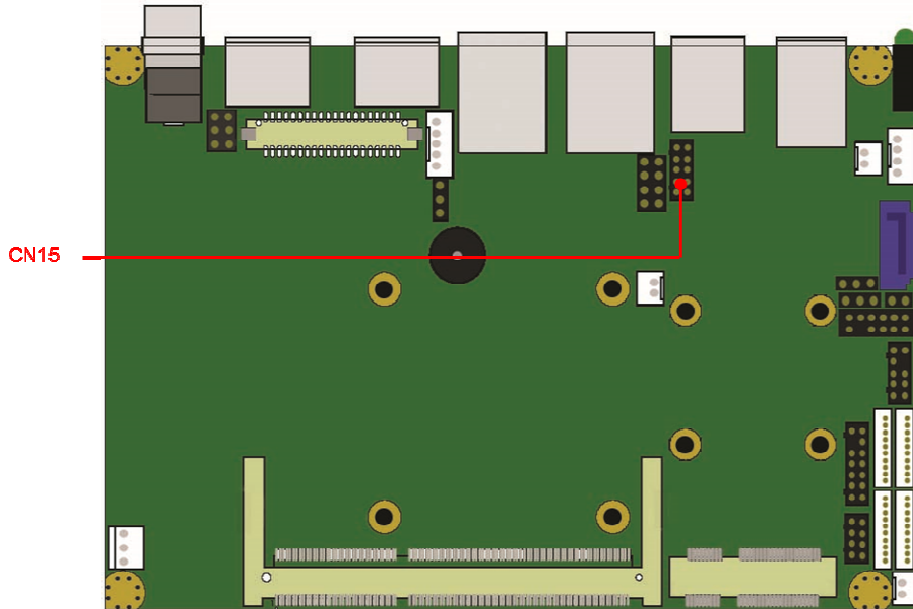
### 2.4.12: CN14 for SPI pin header

CN8 : 1 x 5 wafer			
Pin	Signal	Pin	Signal
1	+3.3V	2	GND
3	SPI_CS0_N	4	SPI_CLK
5	SPI_MISO	6	SPI_MOSI
7	N/A	8	FLASH_IO



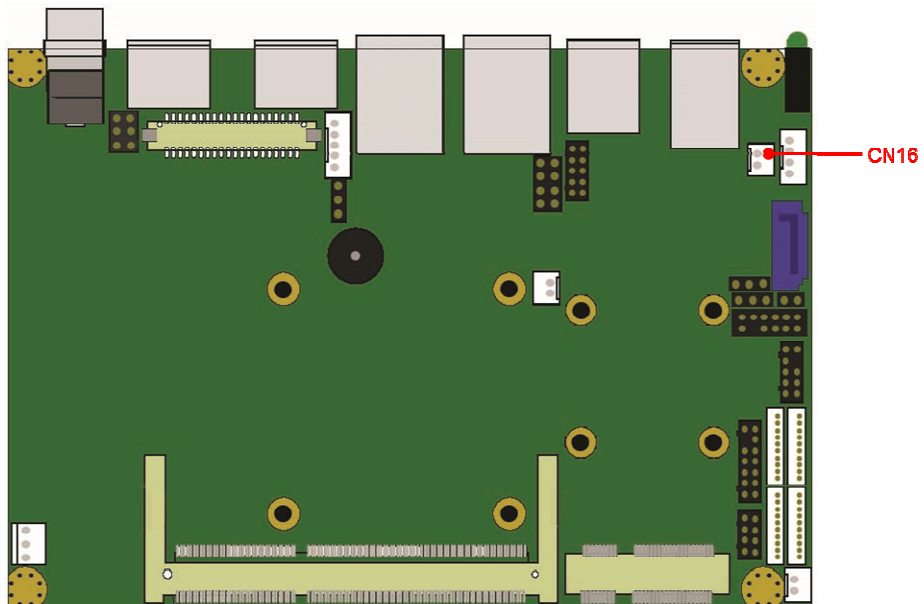
**2.4.13: CN15 for USB2.0 port pin header**

2 x 5 header , pitch 2.0 mm			
Pin	Signal	Pin	Signal
1	+5V	2	+5V
3	USB D-	4	USB D-
5	USB D+	6	USB D+
7	GND	8	GND
9	Key	10	GND



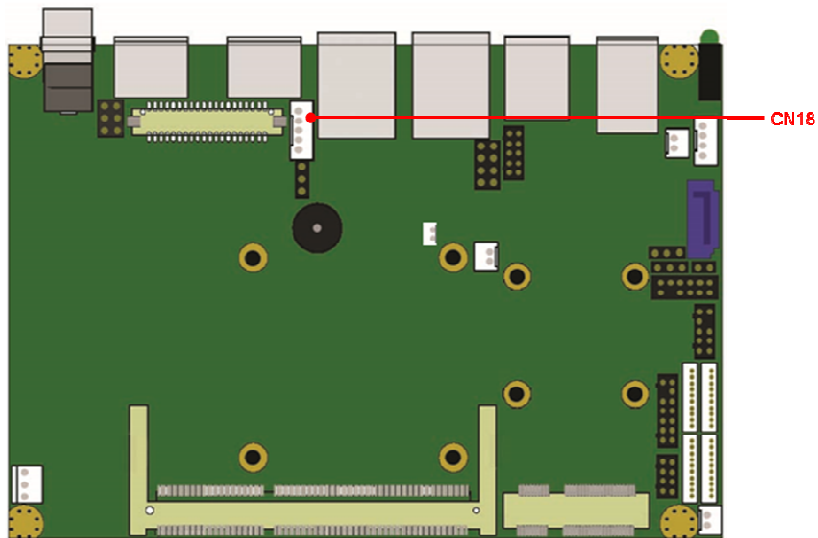
#### 2.4.14: CN16 for System Reset

CN1: 1 x 3 wafer			
Pin	Signal	Pin	Signal
1	GND	2	RESET_L



### 2.4.15: CN18 for Panel Inverter connector

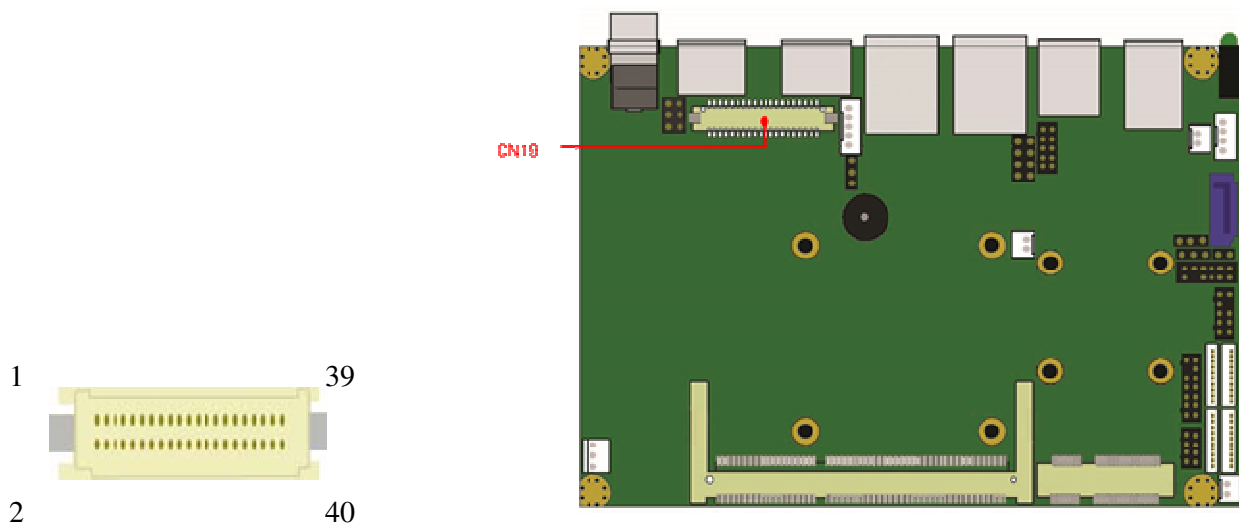
CN15 : 1 x 4 wafer			
Pin	Signal	Pin	Signal
1	INV_PWR +12V	2	GND
3	LVDS_ENABKLT	4	INV_BKLT_CTRL
5	+5V		



### 2.4.16: CN19 for LVDS connector

CN18 : connector type : DF13A-40DP-1.25V					
Pin	Signal	Pin	Signal	Pin	Signal
1	LVDS_VCC	15	LVDSA_1+	29	GND
2	LVDS_VCC	16	LVDSB_1+	30	GND
3	LVDS_VCC	17	GND	31	DDC_Clock
4	LVDS_VCC	18	GND	32	DDC_Data
5	GND	19	LVDSA_2-	33	GND
6	GND	20	LVDSB_2-	34	GND
7	LVDSA_0-	21	LVDSA_2+	35	LVDSA_3-
8	LVDSB_0-	22	LVDSB_2+	36	LVDSB_3-
9	LVDSA_0+	23	GND	37	LVDSA_3+
10	LVDSB_0+	24	GND	38	LVDSB_3+
11	GND	25	LVDSA_Clock-	39	SMB_Clock
12	GND	26	LVDSB_Clock-	40	SMB_Data
13	LVDSA_1-	27	LVDSA_Clock+		
14	LVDSB_1-	28	LVDSB_Clock+		

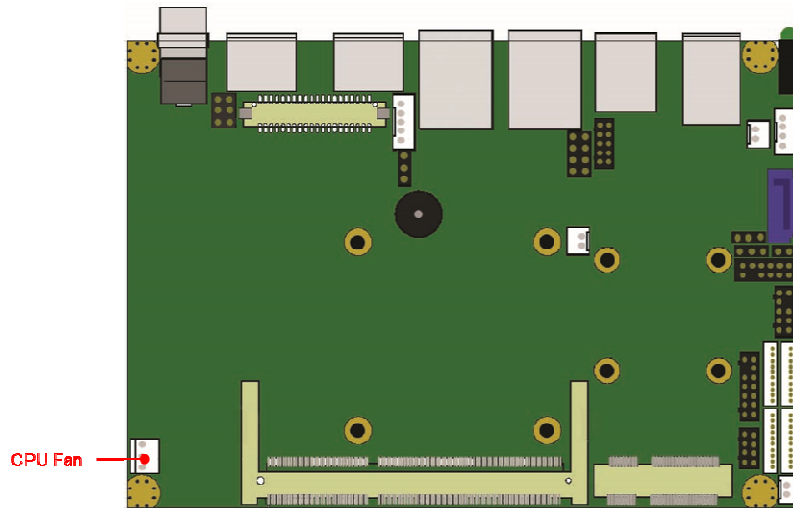
**Note:** Select LVDS\_VCC for 3.3V/5V/12V by JP5.





### 2.4.17 : CPU FAN

1 x 4 header			
Pin	Signal	Pin	Signal
1	GND	2	Vin
3	Sense		



### 3. BIOS setting Menu

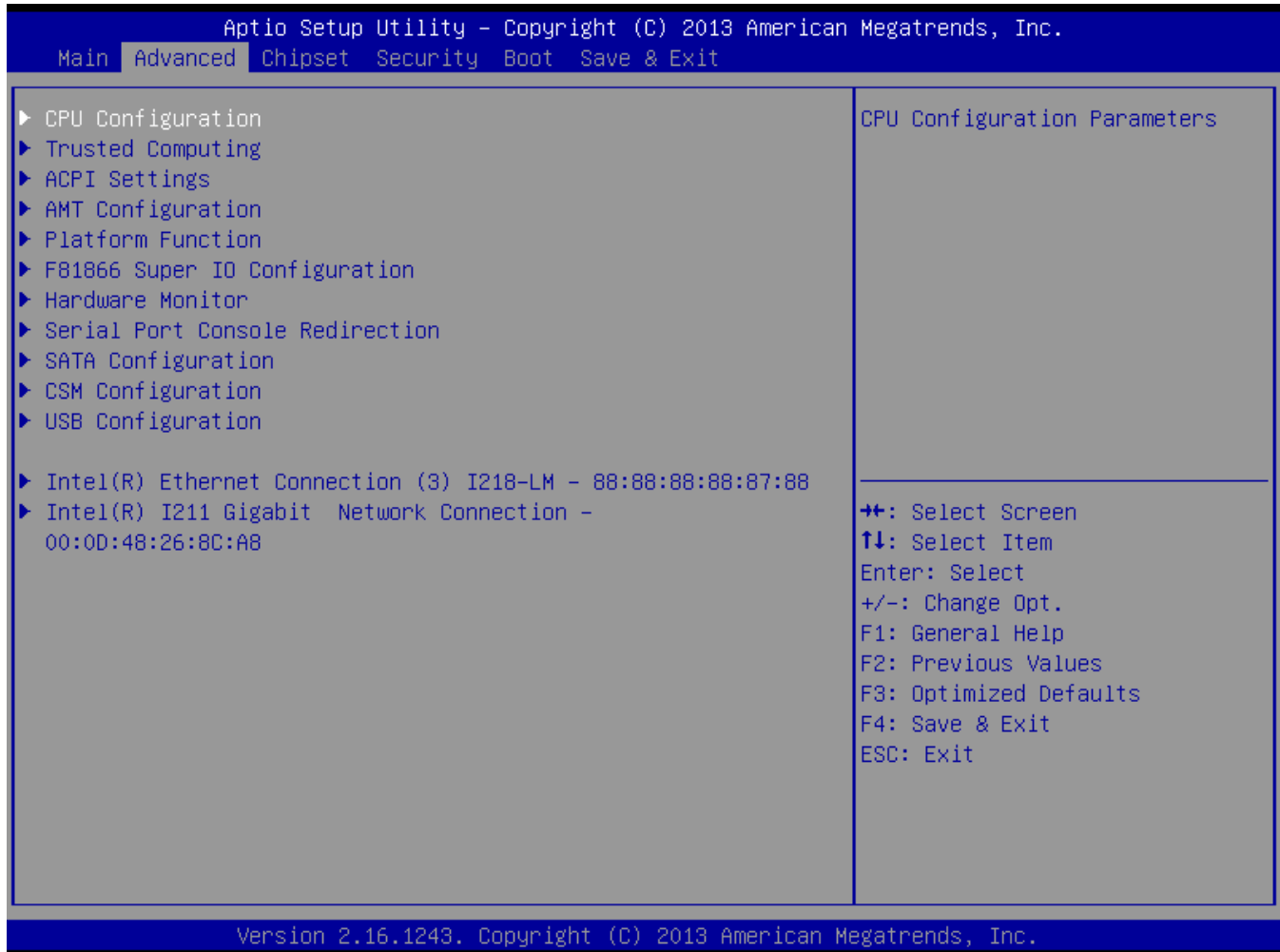
#### 3.1 Main Menu

The Main Menu of BIOS Setup Utility provides a quick overview of basic system information and the ability to change the system, i.e., Date, time, etc.



### 3.2 Advanced Menu

The Advanced Menu of BIOS Setup Utility allows users to configure advanced system settings.



### 3.2.1 CPU Information

CPU Information:

This item displays the current CPU Revision, Current CPU1 Memory Frequency, Memory Type and Memory Reference Code Revision.

Description: This item displays the current CPU information.

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Advanced

CPU Configuration		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.
Genuine Intel(R) CPU 0000 @ 1.60GHz		
Max CPU Speed	1600 MHz	⇧⇩: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Min CPU Speed	600 MHz	
CPU Speed	1700 MHz	
Processor Cores	2	
L1 Data Cache	32 kB x 2	
L2 Cache	256 kB x 2	
L3 Cache	4 MB	
Hyper-threading	[Enabled]	
Execute Disable Bit	[Enabled]	
Intel Virtualization Technology	[Enabled]	
EIST	[Enabled]	
CPU C states	[Enabled]	
Intel TXT(LT) Support	[Disabled]	

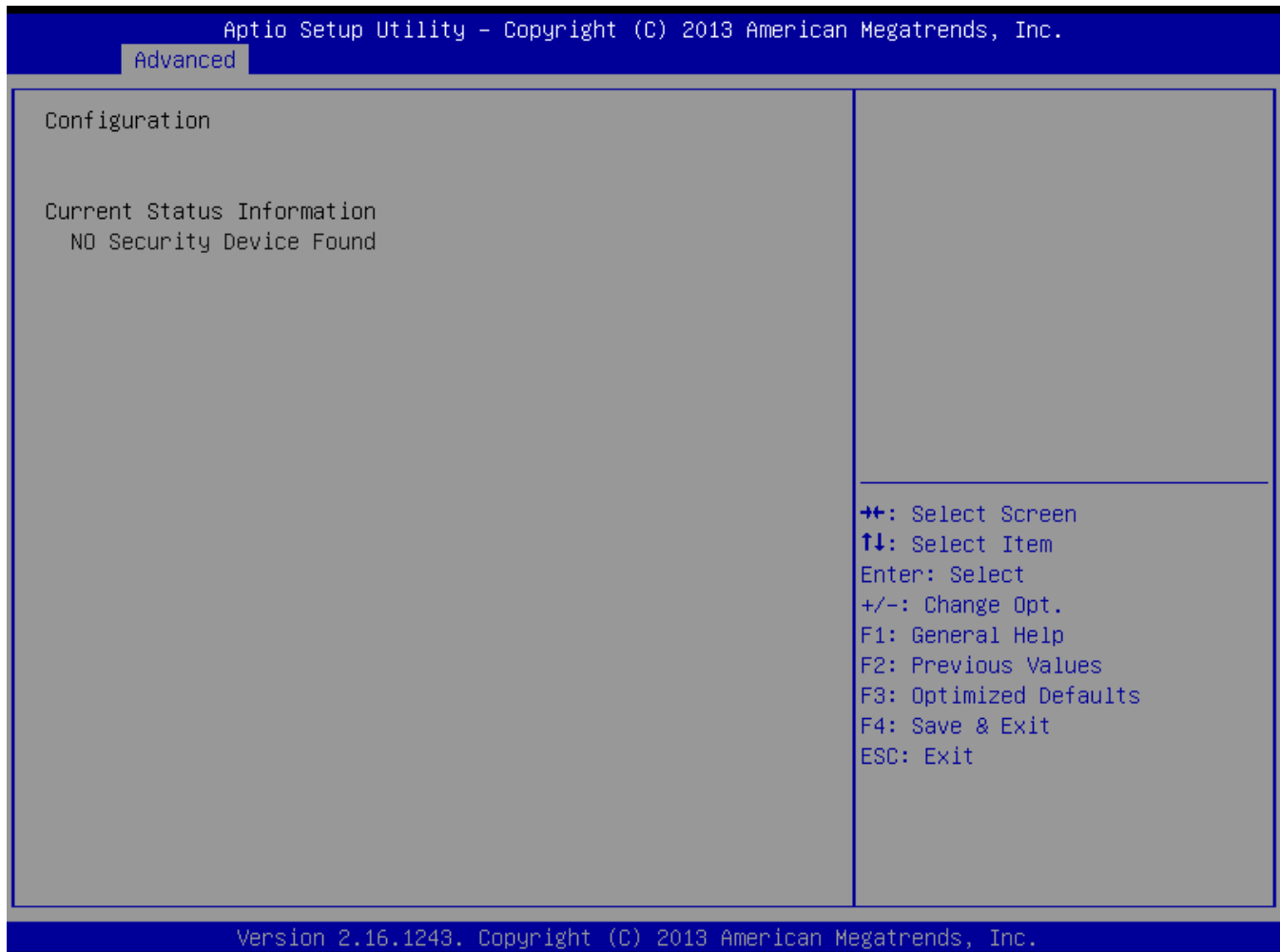
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### 3.2.2 Trusted Computing

Trusted Computing:

*TPM State* < Enable >

Description: Select Enabled to activate support for trusted platforms (TPM 1.1/1.2) and allow the BIOS to automatically download the drivers needed to provide support for the platforms specified. The options are Disable and Enable.

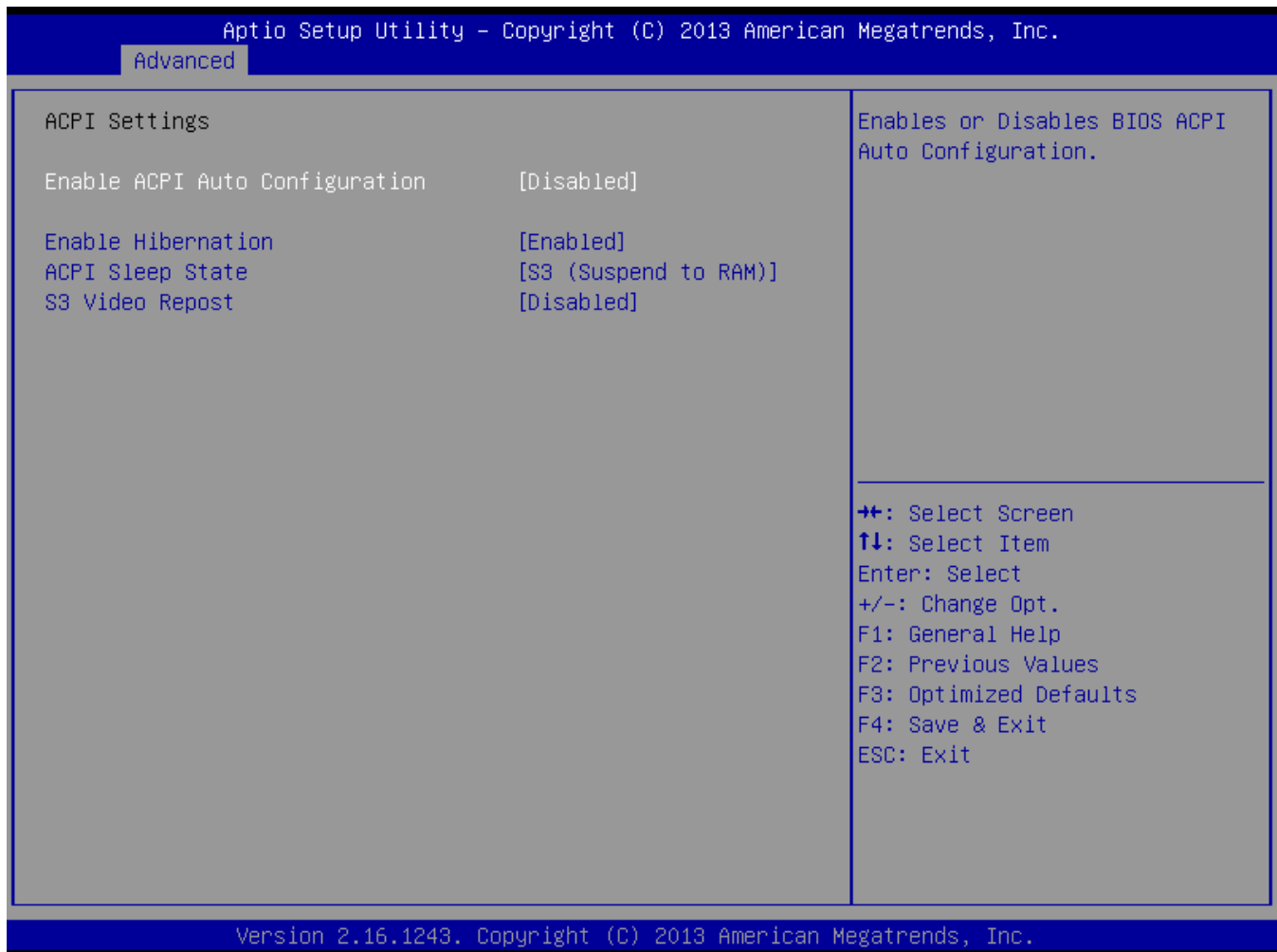


### 3.2.3 ACPI Settings

ACPI Setting:

*Enable ACPI Auto Configuration < Enable >*

Description: Use this feature to configure Advanced Configuration and Power Interface (ACPI) power management settings for your system.



### 3.2.4 AMT Settings

AMT Setting:

*Enable AMT Configuration < Enable >*

Description: Use this feature to enable Intel Active Management Technology settings for your system.

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Advanced

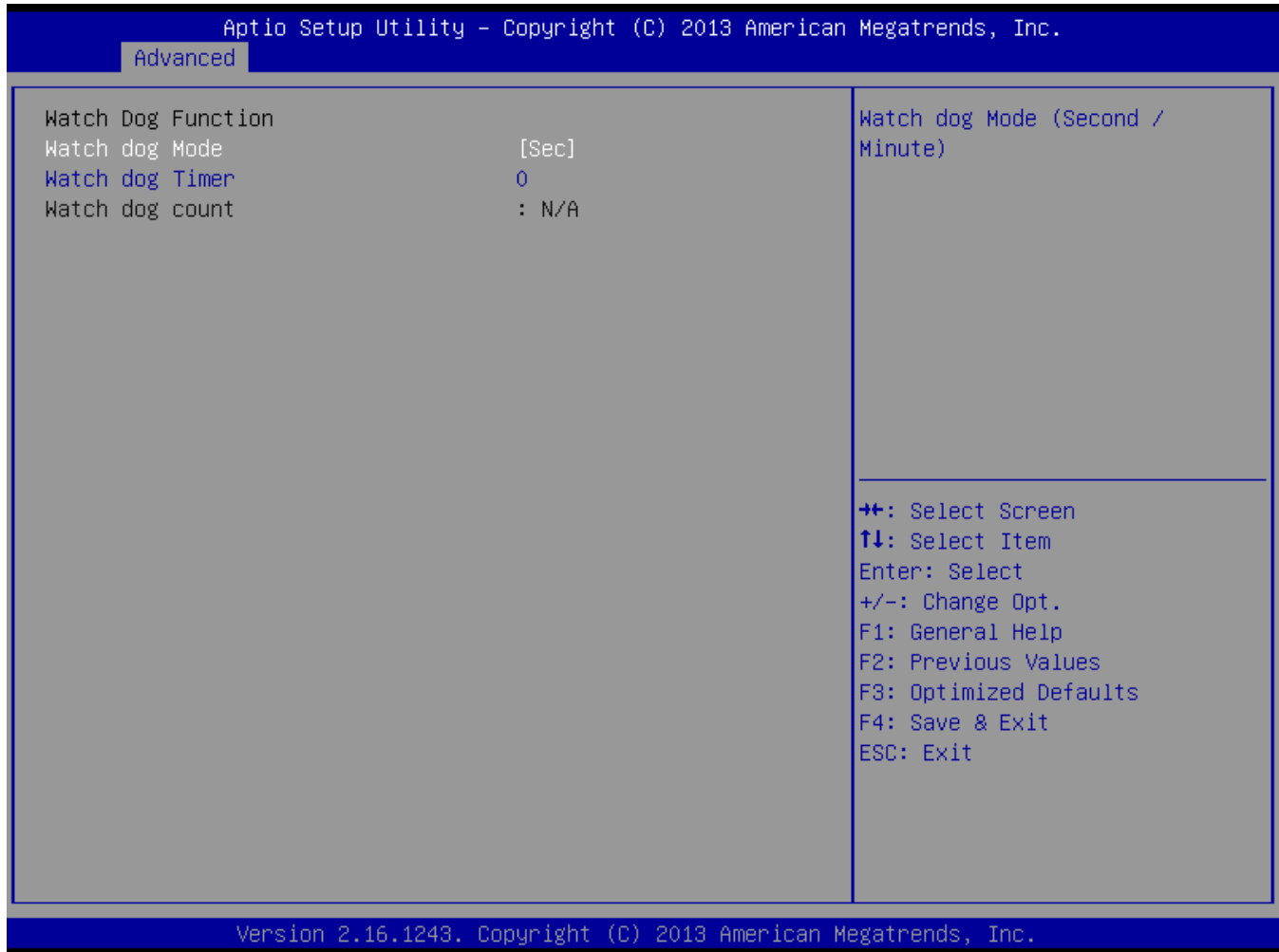
Intel AMT	[Enabled]	Enable/Disable Intel (R) Active Management Technology BIOS Extension. Note : iAMT H/W is always enabled. This option just controls the BIOS extension execution. If enabled, this requires additional firmware in the SPI device	
BIOS Hotkey Pressed	[Disabled]		
MEBx Selection Screen	[Disabled]		
Hide Un-Configure ME Confirmation Prompt	[Disabled]		
MEBx Debug Message Output	[Disabled]		
Un-Configure ME	[Disabled]		
Amt Wait Timer	0		
Disable ME	[Disabled]		
ASF	[Enabled]		
Activate Remote Assistance Process	[Disabled]		
USB Configure	[Enabled]		
PET Progress	[Enabled]		
AMT CIRA Timeout	0		
WatchDog	[Disabled]		
OS Timer	0		
BIOS Timer	0		
			⇐⇒: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit

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### 3.2.5 Platform Function

Platform Function

Description: Enables user to configure WatchDog Timer.

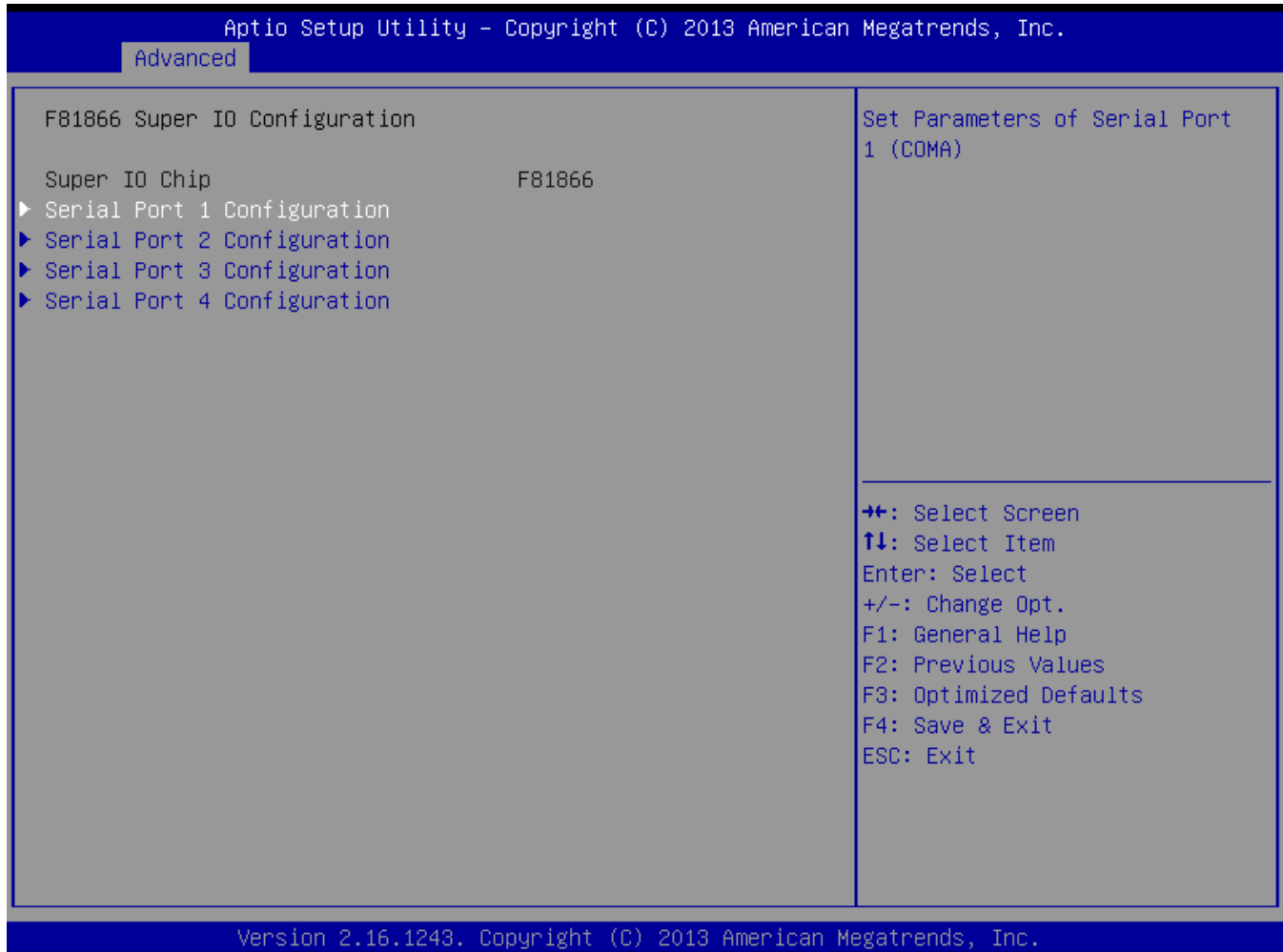




### 3.2.6 F81866 Super IO Configuration

F81866 Super IO Configuration:

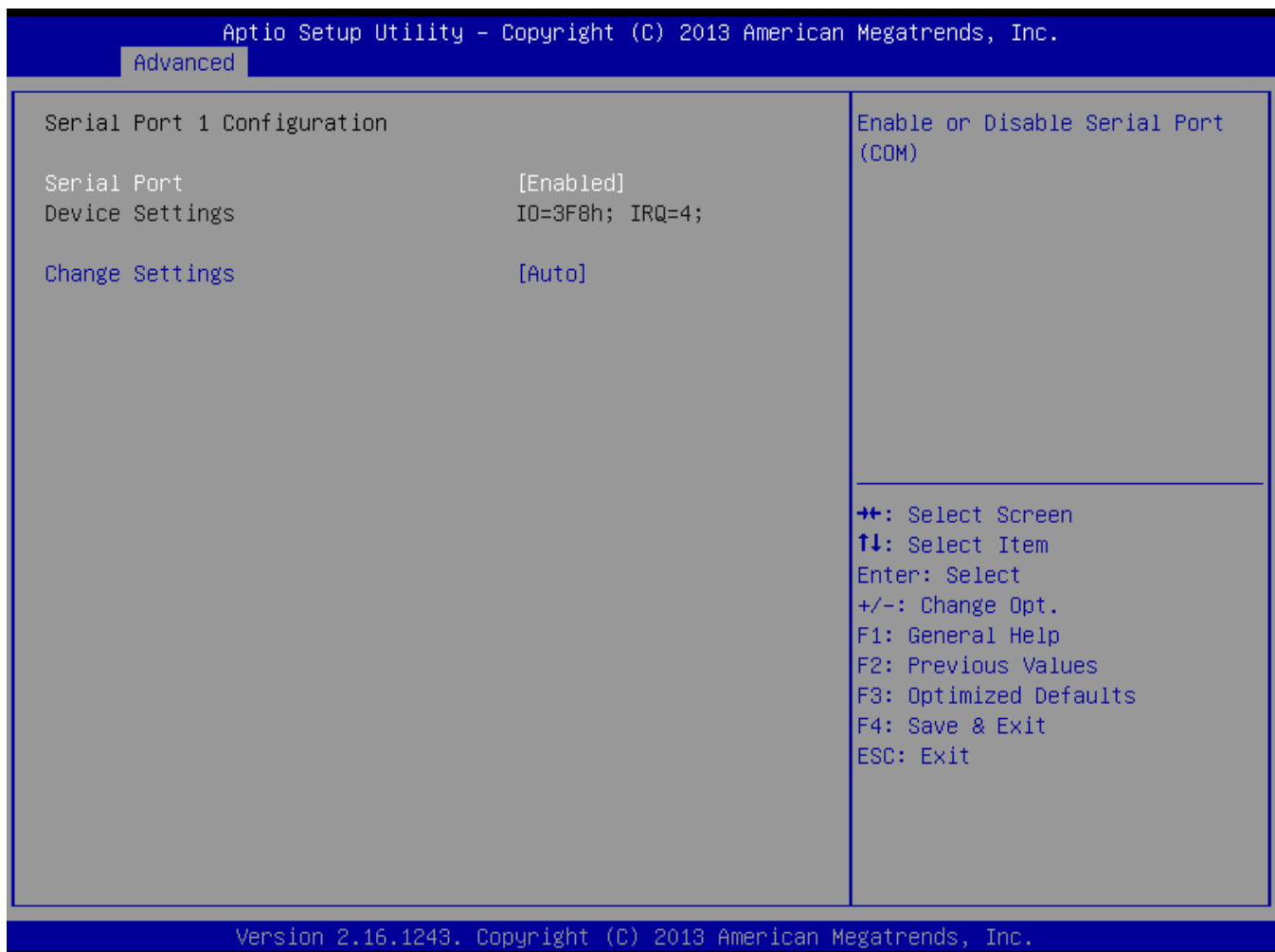
Description: Select *Enabled* to enable the onboard serial port. The options are Enabled and Disabled.



### 3.2.7 Serial Port 1 Configuration

Serial Port 1 Configuration

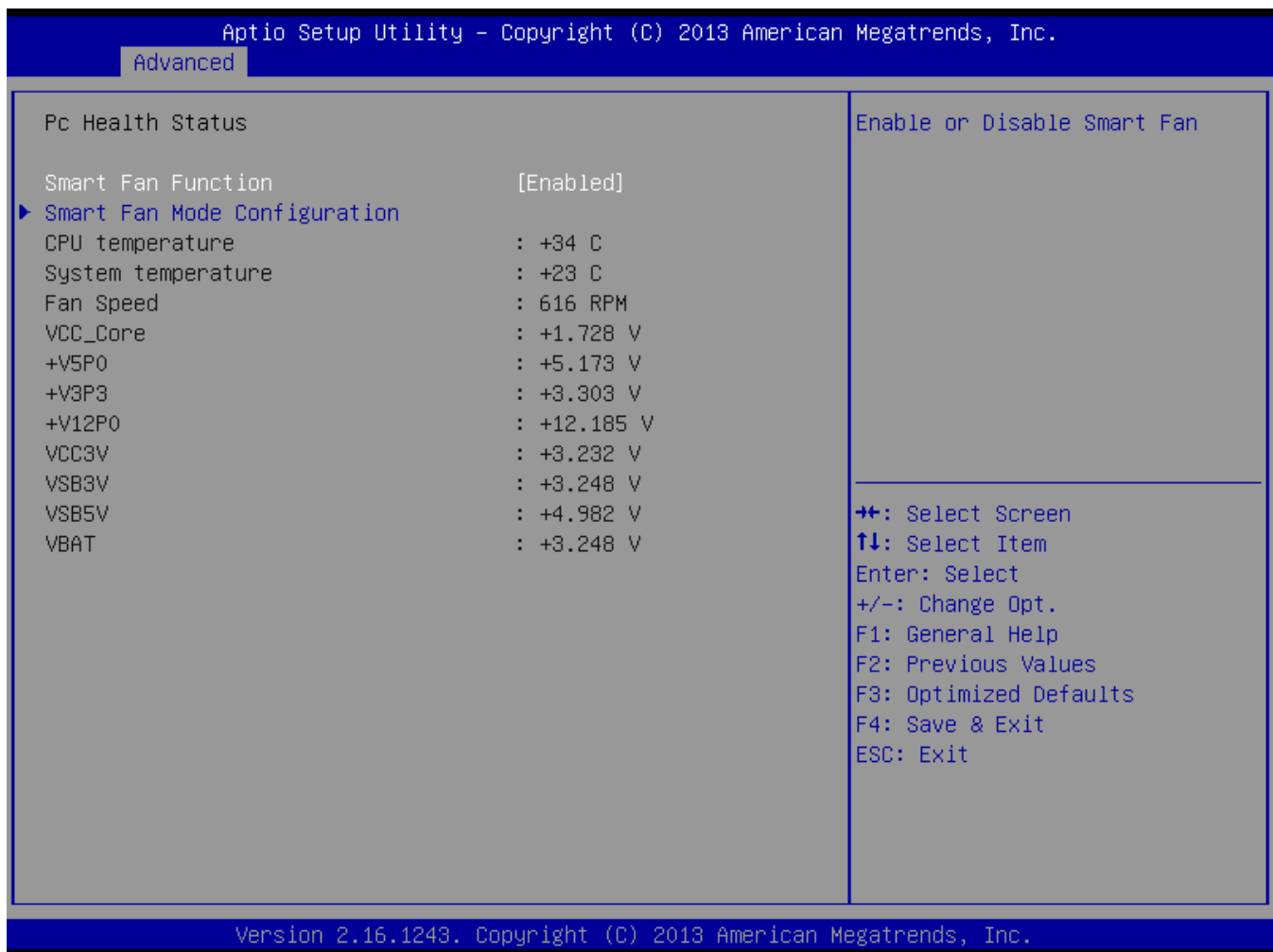
Description: Enables user to setup address and IRQ for serial Port.



### 3.2.8 F81866 H/W Monitor

Hardware Monitor

Description: Enables user to monitor processor and system status. Smart FAN can also be controlled by this menu.



### 3.2.9 Smart Fan Mode Configuration

Smart Fancontrol Mode

Description: Enables user to control smart fan with either manual or auto mode.



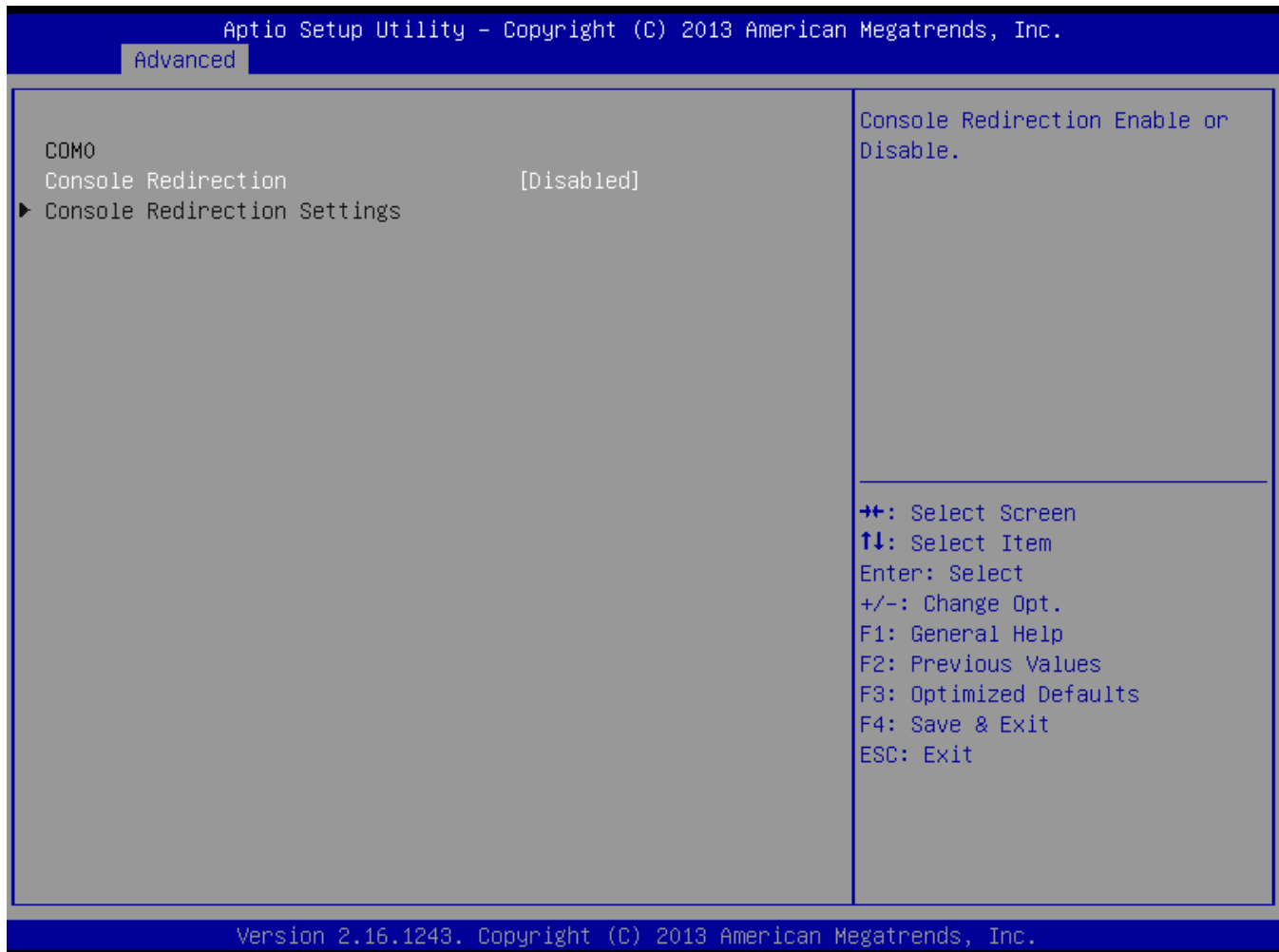
### 3.2.10 Serial Port Console Redirection

Serial Port Console Redirection

Console Redirection < Enable >

Description: This feature enables the user to remotely access the entire boot sequence via a serial console

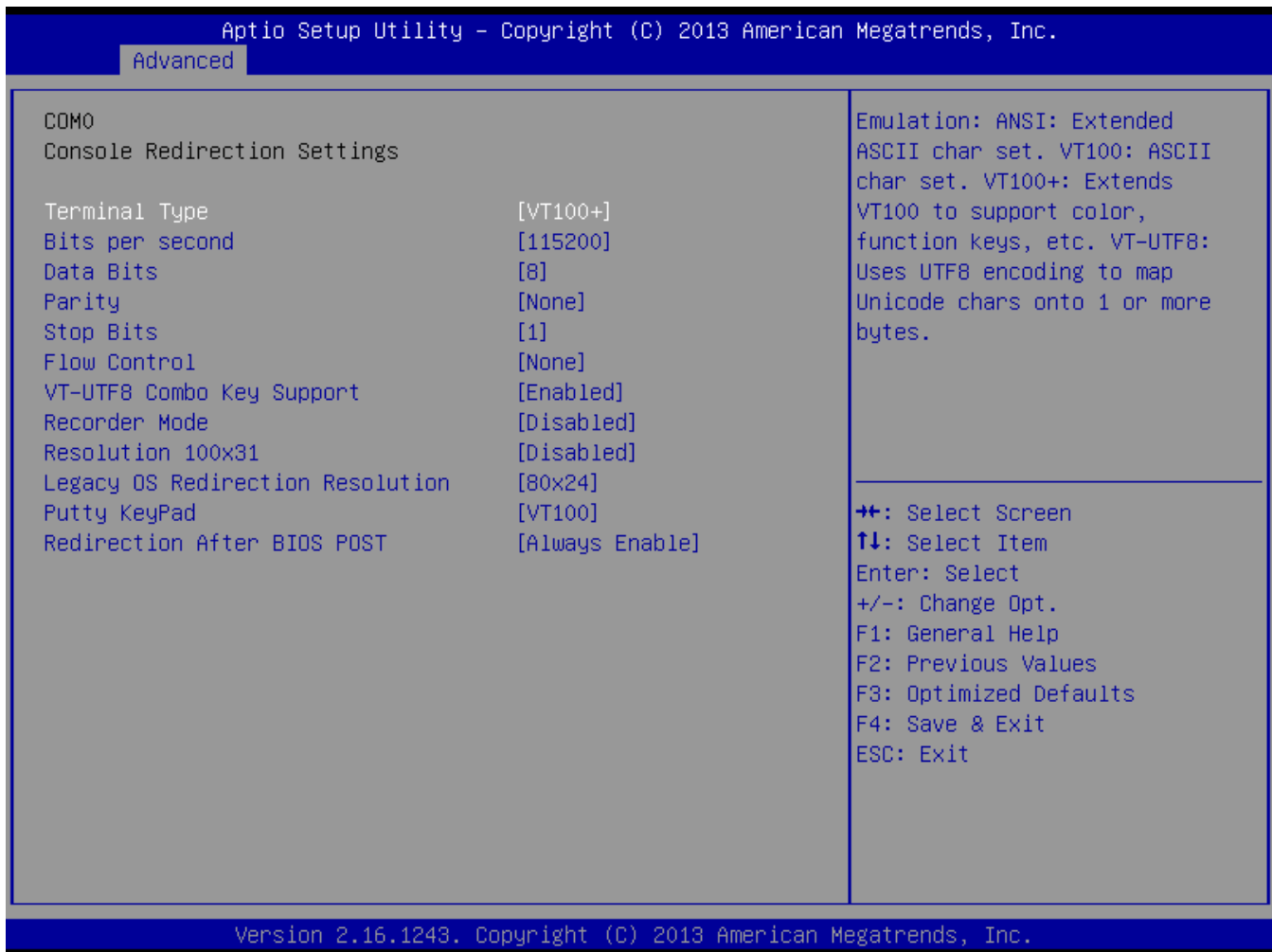
Default setting is Enable



### 3.2.11 COM0

COM0 configuration

Description: Enables user to configure COM0, Console Redirection.



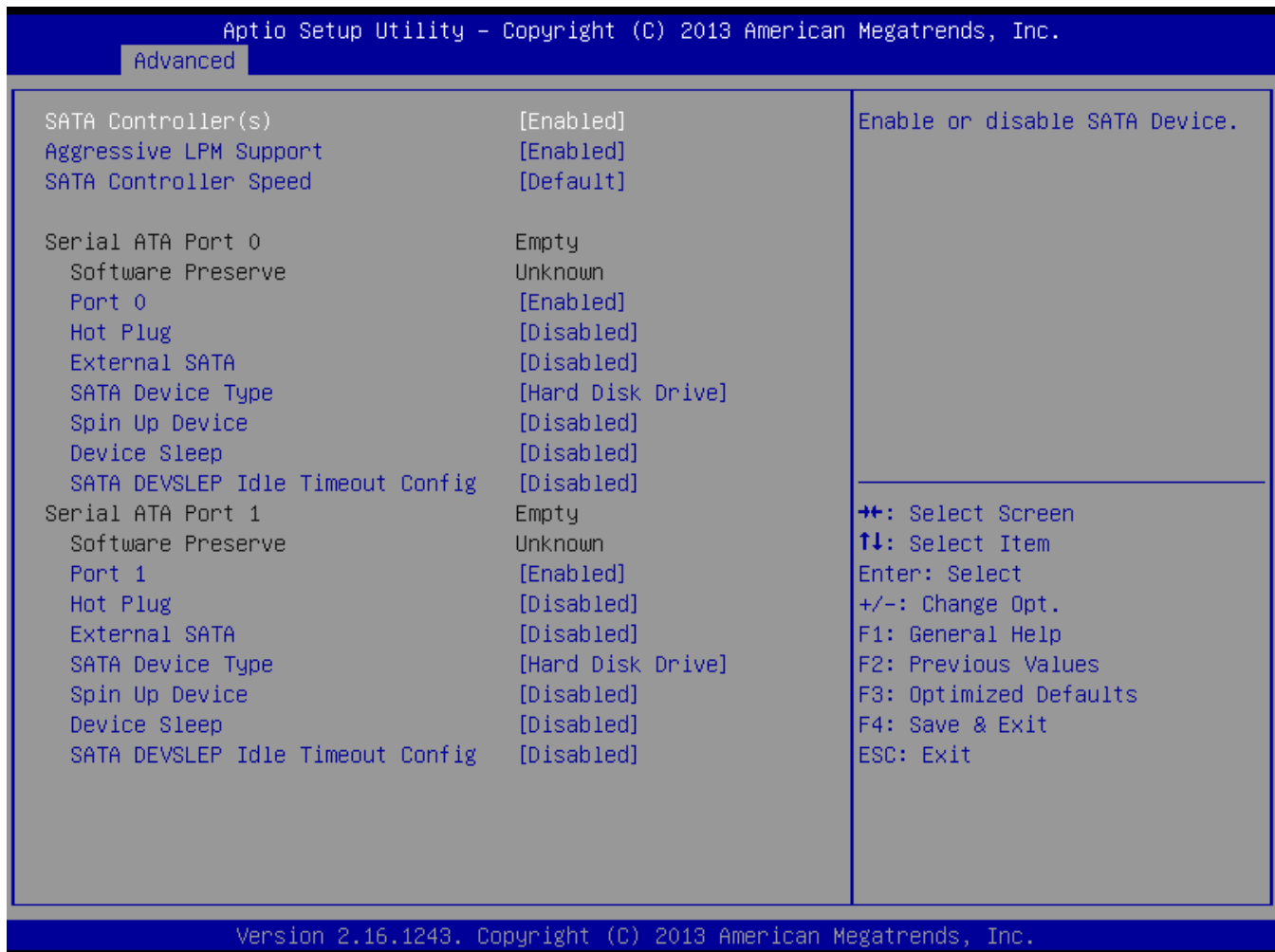
### 3.2.12 SATA Configuration

**SATA Configuration:**

When this submenu is selected, the AMI BIOS automatically detects the presence of the IDE Devices and displays the following items:

**SATA Mode Selection:**

This item selects the mode for the installed drives. The options are Disabled, IDE Mode, AHCI Mode



### 3.2.13 CSM Configuration

#### SCM Configuration

Description: Enables user to configure CSM support. Options are enable or disable.

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Advanced

Compatibility Support Module Configuration		Enable/Disable CSM Support.
CSM Support	[Enabled]	
CSM16 Module Version	07.75	
GateA20 Active	[Upon Request]	
Option ROM Messages	[Force BIOS]	
INT19 Trap Response	[Immediate]	
Boot option filter	[UEFI and Legacy]	
Option ROM execution		
Network	[Do not launch]	
Storage	[Legacy]	
Video	[Legacy]	
Other PCI devices	[UEFI]	

++: Select Screen  
 ↑↓: Select Item  
 Enter: Select  
 +/-: Change Opt.  
 F1: General Help  
 F2: Previous Values  
 F3: Optimized Defaults  
 F4: Save & Exit  
 ESC: Exit

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### 3.2.14 USB Configuration

**USB Configuration:**

This feature enables support for USB function parameters Options are Enabled and Disabled.

**Legacy USB Support:**

This feature enables support for legacy USB devices. Select Auto to disable legacy support if USB devices are not present. Select Disable to have USB devices available only for EFI applications. Options are Enabled, Disabled and Auto.

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Advanced

<p>USB Configuration</p> <p>USB Module Version                    8.11.02</p> <p>USB Devices:     1 Drive, 1 Keyboard, 1 Hub</p> <p>Legacy USB Support                    [Enabled]  XHCI Hand-off                            [Enabled]  EHCI Hand-off                            [Disabled]  USB Mass Storage Driver Support      [Enabled]</p> <p>USB hardware delays and time-outs:  USB transfer time-out                    [20 sec]  Device reset time-out                    [20 sec]  Device power-up delay                    [Auto]</p> <p>Mass Storage Devices:  ADATA USB Flash Drive 1.00            [Auto]</p>	<p>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.</p> <hr/> <p>←→: Select Screen  ↑↓: Select Item  Enter: Select  +/-: Change Opt.  F1: General Help  F2: Previous Values  F3: Optimized Defaults  F4: Save &amp; Exit  ESC: Exit</p>
--	---

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### 3.3 Chipset Menu

Chipset:

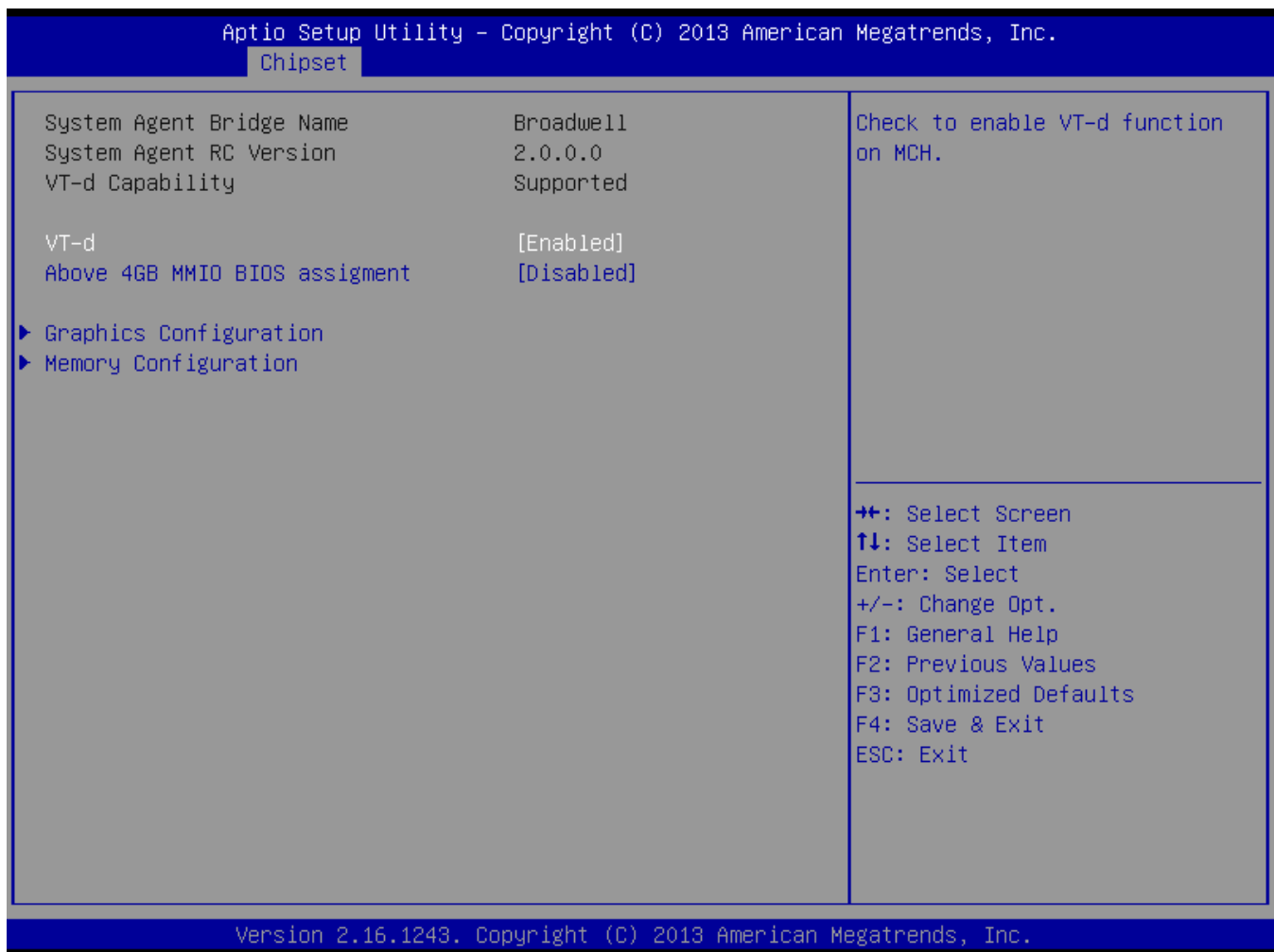
Description: South Bridge & North Bridge Settings



### 3.3.1 System Agent (SA) Configuration

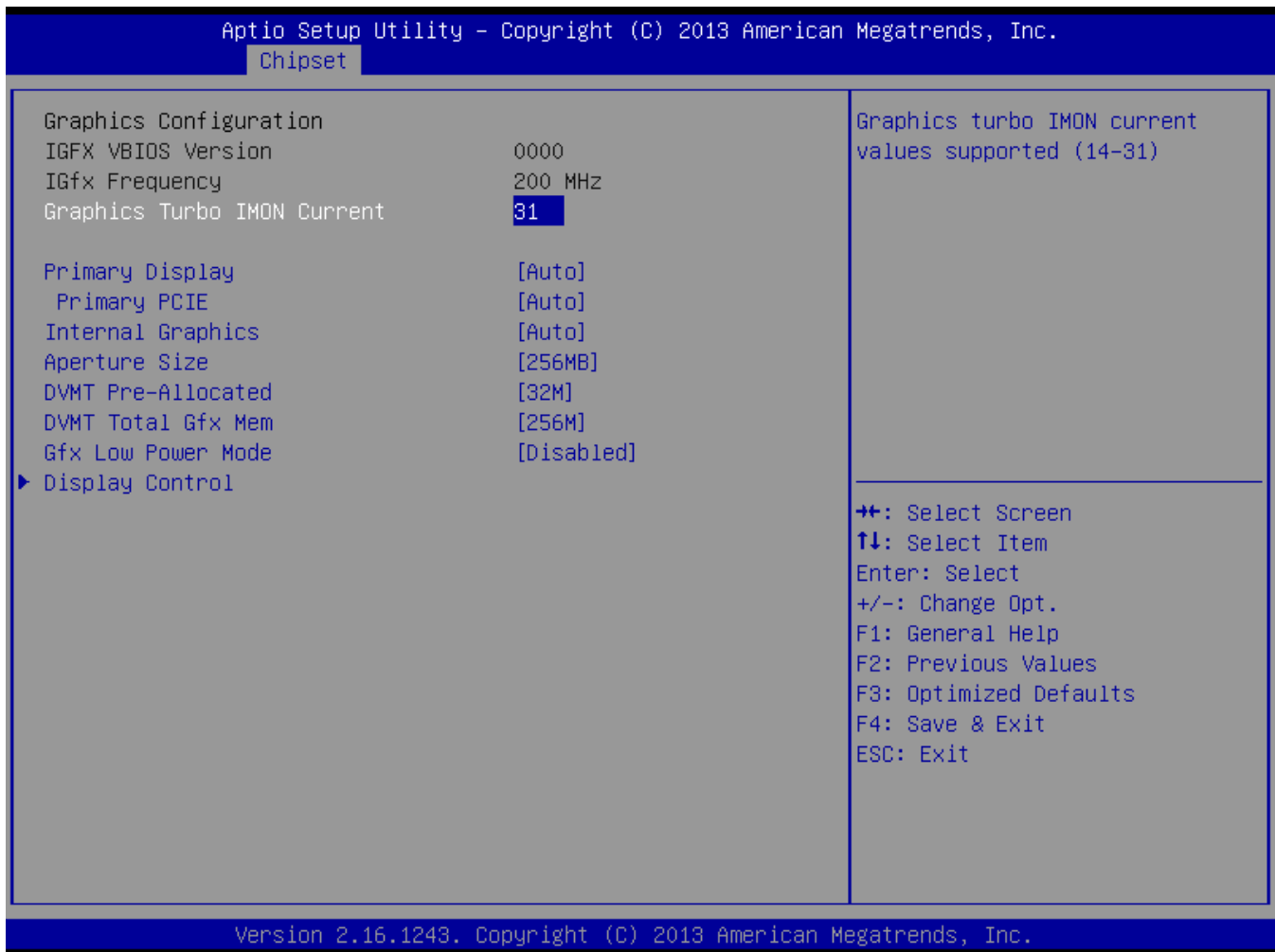
System Agent (SA) Configuration

Description: Enables user to configure parameter of COM 0 (console port).



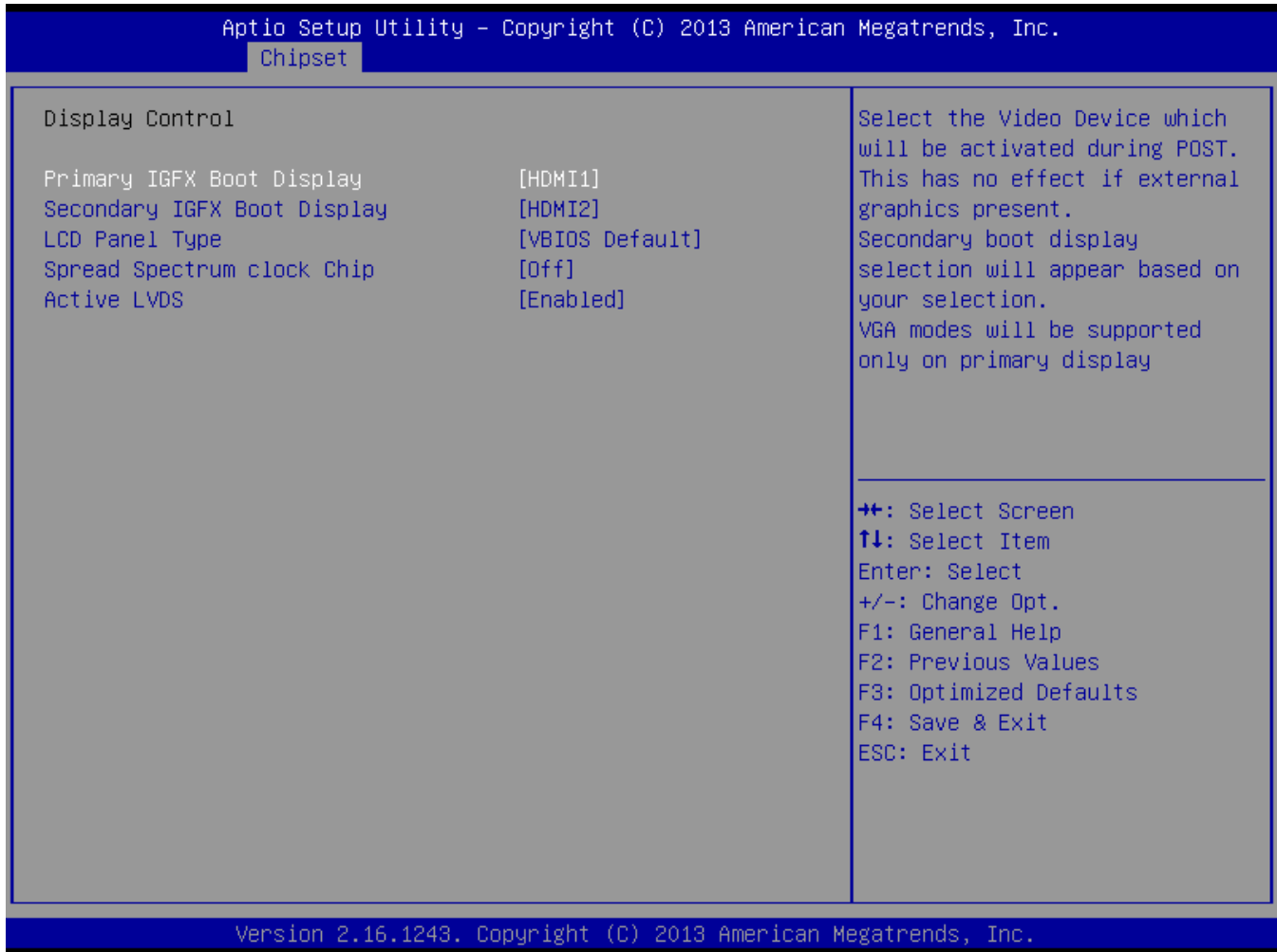
### 3.3.2 Graphics Configuration

Description: Enables user to enable/disable integrated graphic and display priority.



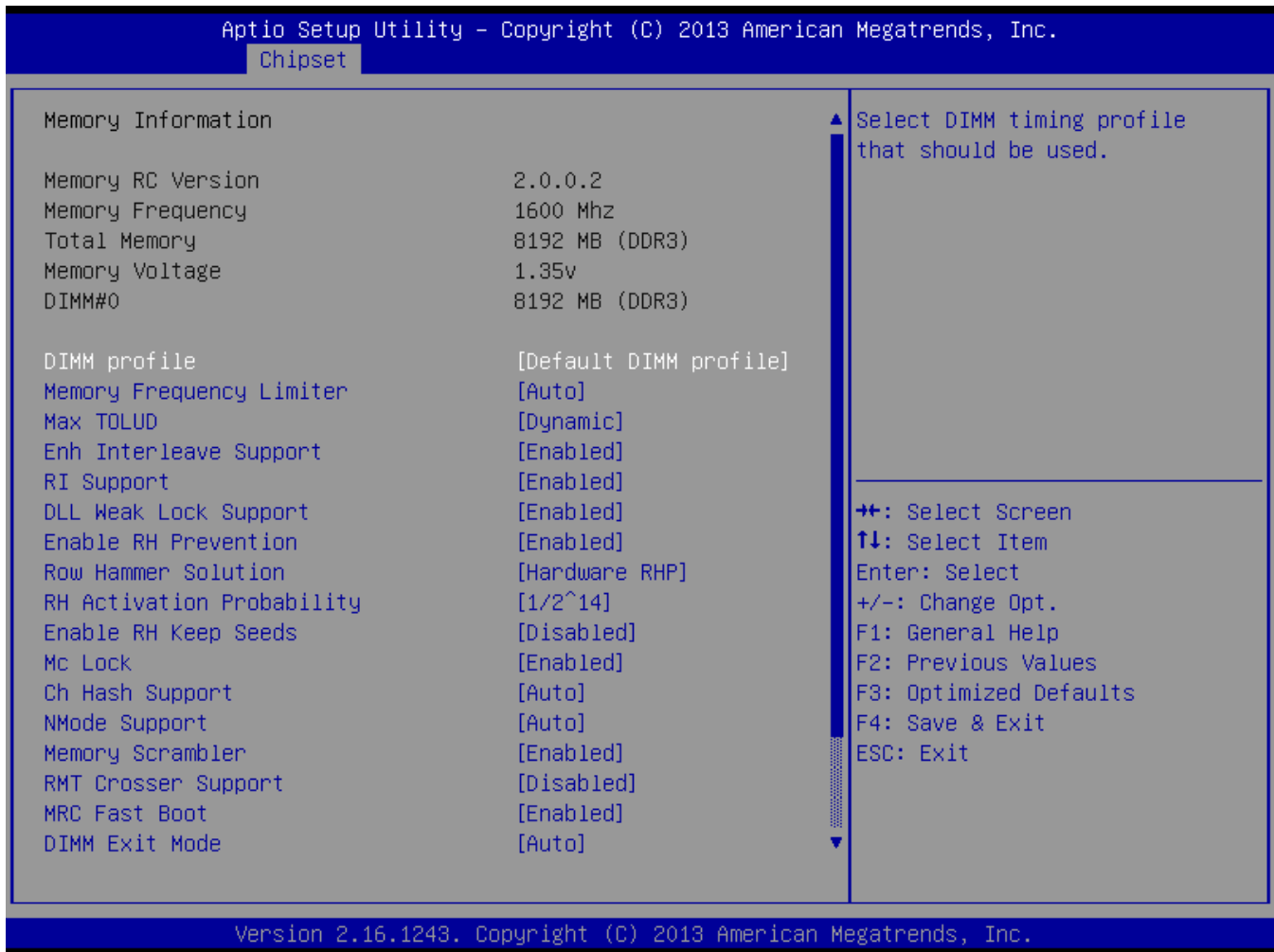
### 3.3.3 Display Control Configuration

Description: Enables user to enable/disable integrated graphic and display priority.



### 3.3.4 Memory Configuration

Description: This Menu accesses system memory information and enables user to set up parameter for DIMM.



The screenshot shows the 'Aptio Setup Utility - Copyright (C) 2013 American Megatrends, Inc.' interface. The 'Chipset' menu is selected, and the 'Memory Information' sub-menu is active. The screen is divided into two main sections: a list of memory parameters on the left and a help/legend section on the right.

Memory Information	
Memory RC Version	2.0.0.2
Memory Frequency	1600 Mhz
Total Memory	8192 MB (DDR3)
Memory Voltage	1.35v
DIMM#0	8192 MB (DDR3)
DIMM profile	[Default DIMM profile]
Memory Frequency Limiter	[Auto]
Max TOLUD	[Dynamic]
Enh Interleave Support	[Enabled]
RI Support	[Enabled]
DLL Weak Lock Support	[Enabled]
Enable RH Prevention	[Enabled]
Row Hammer Solution	[Hardware RHP]
RH Activation Probability	[1/2^14]
Enable RH Keep Seeds	[Disabled]
Mc Lock	[Enabled]
Ch Hash Support	[Auto]
NMode Support	[Auto]
Memory Scrambler	[Enabled]
RMT Crosser Support	[Disabled]
MRC Fast Boot	[Enabled]
DIMM Exit Mode	[Auto]

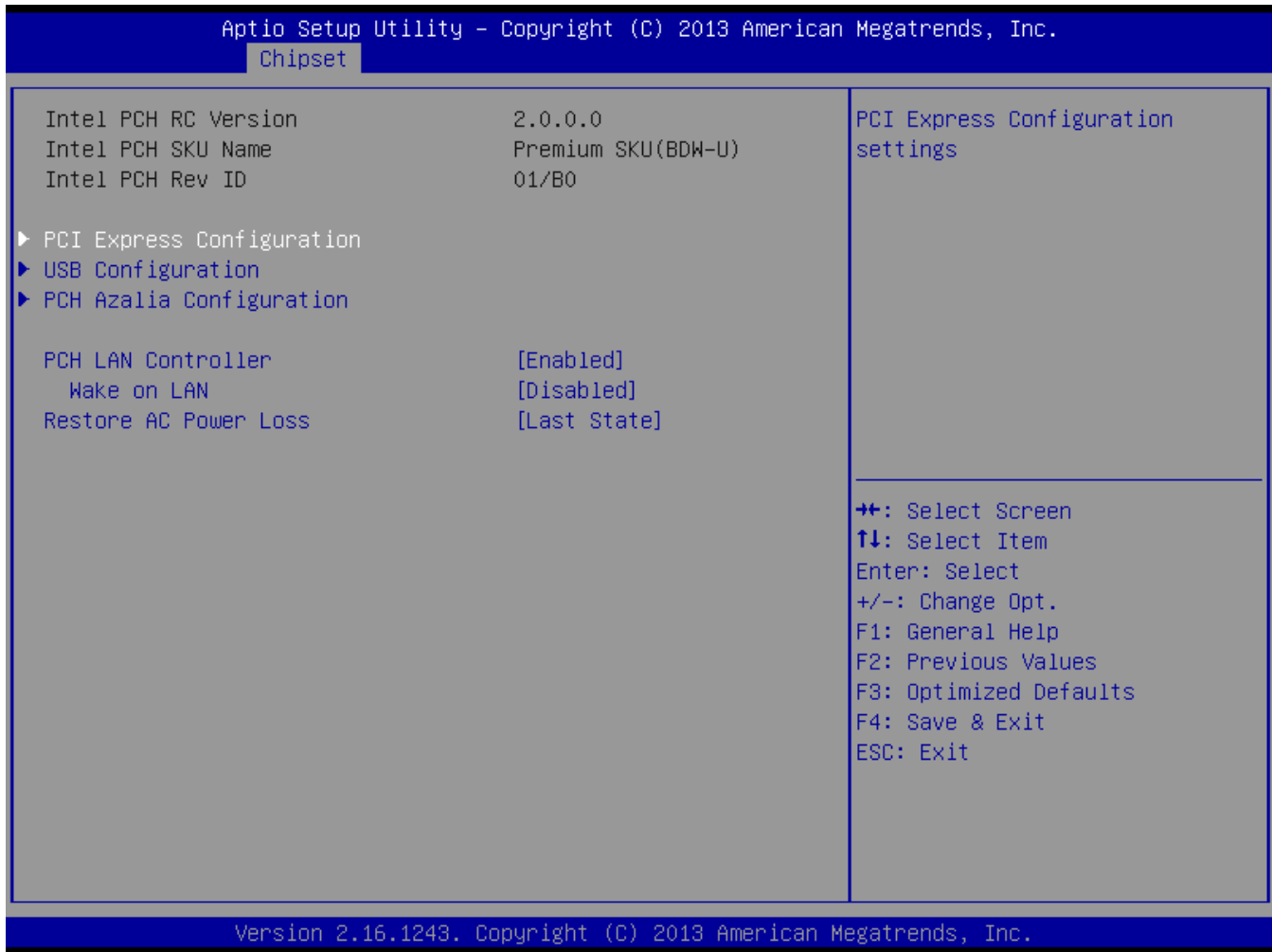
**Select DIMM timing profile that should be used.**

▲ Select DIMM timing profile that should be used.  
 ▼  
 ⇐: Select Screen  
 ⇕: Select Item  
 Enter: Select  
 +/-: Change Opt.  
 F1: General Help  
 F2: Previous Values  
 F3: Optimized Defaults  
 F4: Save & Exit  
 ESC: Exit

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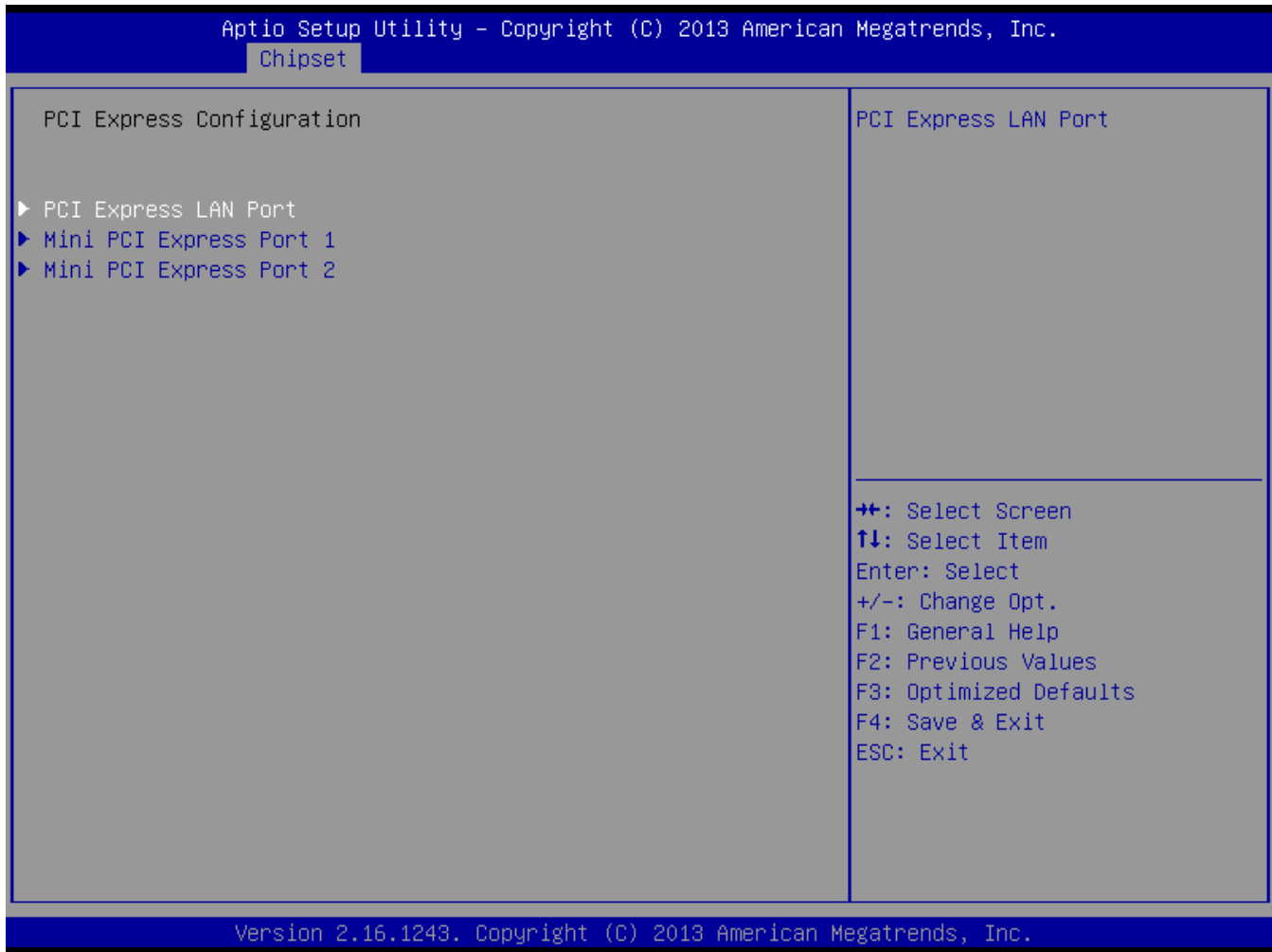
### 3.3.5 PCH-IO Configuration

Description: This menu enables user to configure PCH I/O, e.g., PCI, USB, Audio, etc.



- **3.3.5.1 PCI Express Configuration**

Description: This menu enables user to configure PCIe Peripheral on PCH, e.g., LAN, mini PCIe, etc.





- **3.3.5.1.1 PCI Express LAN Port Configuration**

Description: Enables user to configure PCIe LAN port on PCH. General PCIe settings can be configured here as well.

Aptio Setup Utility - Copyright (C) 2013 American Megatrends, Inc.		
Chipset		
PCI Express LAN Port	[Enabled]	Control the PCI Express Root Port.
ASPM	[Auto]	
L1 Substates	[L1.1 & L1.2]	
URR	[Disabled]	
FER	[Disabled]	
NFER	[Disabled]	
CER	[Disabled]	
CTO	[Disabled]	
SEFE	[Disabled]	
SENF	[Disabled]	
SECE	[Disabled]	
PME SCI	[Enabled]	
Hot Plug	[Disabled]	
PCIe Speed	[Auto]	
Detect Non-Compliance Device	[Disabled]	
Extra Bus Reserved	0	
Reserved Memory	10	
Prefetchable Memory	10	
Reserved I/O	4	
PCIe LTR	[Enabled]	
PCIe LTR Lock	[Disabled]	
Snoop Latency Ocerride	[Auto]	
Non Snoop Latency Ocerride	[Auto]	
<div style="display: flex; justify-content: space-between;"> <div style="width: 60%;"> <p>⇄: Select Screen</p> <p>↑↓: Select Item</p> <p>Enter: Select</p> <p>+/-: Change Opt.</p> <p>F1: General Help</p> <p>F2: Previous Values</p> <p>F3: Optimized Defaults</p> <p>F4: Save &amp; Exit</p> <p>ESC: Exit</p> </div> </div>		
Version 2.16.1243. Copyright (C) 2013 American Megatrends, Inc.		

- **3.3.5.1.2 Mini PCI Express Configuration**

Description: Enables user to configure mini PCIe. General PCIe settings can be configured here as well.

Aptio Setup Utility - Copyright (C) 2013 American Megatrends, Inc.		
Chipset		
Mini PCI Express Port 1	[Enabled]	Control the PCI Express Root Port.  <hr/> ⇐⇐: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
ASPM	[Auto]	
L1 Substates	[L1.1 & L1.2]	
URR	[Disabled]	
FER	[Disabled]	
NFER	[Disabled]	
CER	[Disabled]	
CTO	[Disabled]	
SEFE	[Disabled]	
SENF	[Disabled]	
SECE	[Disabled]	
PME SCI	[Enabled]	
Hot Plug	[Disabled]	
PCIe Speed	[Auto]	
Detect Non-Compliance Device	[Disabled]	
Extra Bus Reserved	0	
Reserved Memory	10	
Prefetchable Memory	10	
Reserved I/O	4	
PCIe LTR	[Enabled]	
PCIe LTR Lock	[Disabled]	
Snoop Latency Override	[Auto]	
Non Snoop Latency Override	[Auto]	

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- **3.3.5.2 USB Configuration**

USB Configuration:

Description: Legacy USB support setup. These settings enable user to configure USB parameters, including whether to support legacy USB.

Aptio Setup Utility - Copyright (C) 2013 American Megatrends, Inc.		
Chipset		
USB Configuration		Precondition work on USB host controller and root ports for faster enumeration.
USB Precondition	[Enabled]	
XHCI Mode	[Smart Auto]	
BTCG	[Enabled]	
USB Port #0	[Enabled]	
USB Port #1	[Enabled]	
USB Port #2	[Enabled]	
USB Port #3	[Enabled]	
USB Port #4	[Enabled]	
USB Port #5	[Enabled]	
USB Port #6	[Enabled]	
USB Port #7	[Enabled]	
		⇐: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version 2.16.1243. Copyright (C) 2013 American Megatrends, Inc.		

- **3.3.5.3 Azalia Configuration**

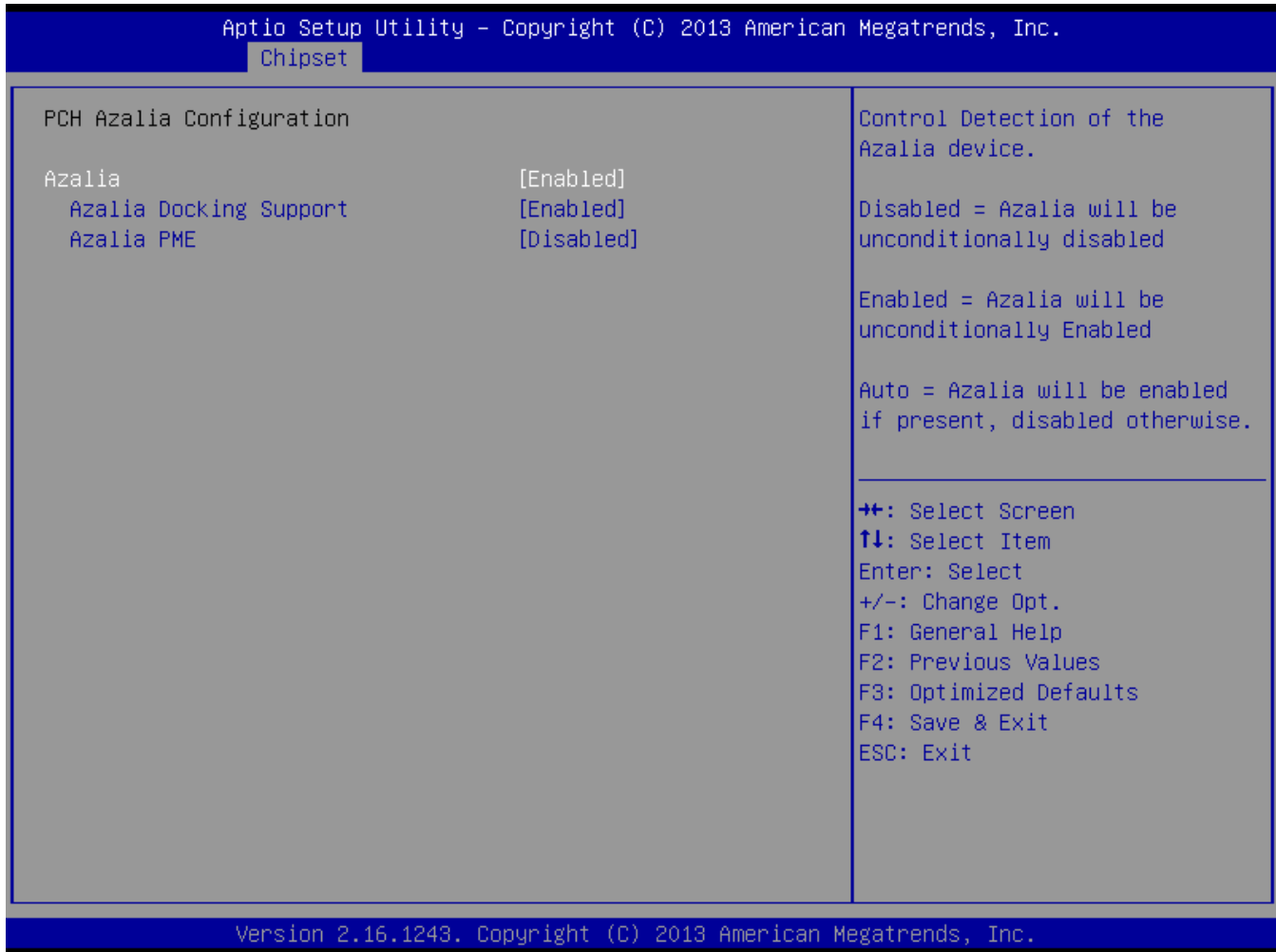
SB HD Azalia configuration:

*HD Audio Azalia Device* < Disabled/enabled >

Description: Select *Enabled* to enable the Azalia High Definition Audio feature.

Settings are Enabled and Disabled.

Default setting is <Enabled>



### 3.4 Security Menu

Password Description:

Description:

Administrator Password: Press Enter to create a new, or change an existing Administrator password.

User Password: Press Enter to create a new, or change an existing User password.

Aptio Setup Utility - Copyright (C) 2013 American Megatrends, Inc.					
Main Advanced Chipset Security Boot Save & Exit					
<p>Password Description</p> <p>If ONLY the Administrator's password is set, then this only limits access to Setup and is only asked for when entering Setup.</p> <p>If ONLY the User's password is set, then this is a power on password and must be entered to boot or enter Setup. In Setup the User will have Administrator rights.</p> <p>The password length must be in the following range:</p> <table> <tr> <td>Minimum length</td> <td>3</td> </tr> <tr> <td>Maximum length</td> <td>20</td> </tr> </table> <p>Administrator Password</p> <p>User Password</p>	Minimum length	3	Maximum length	20	<p>Set Administrator Password</p> <hr/> <p>           ⇄: Select Screen            ↑↓: Select Item            Enter: Select            +/-: Change Opt.            F1: General Help            F2: Previous Values            F3: Optimized Defaults            F4: Save &amp; Exit            ESC: Exit         </p>
Minimum length	3				
Maximum length	20				
Version 2.16.1243. Copyright (C) 2013 American Megatrends, Inc.					

### 3.5 Boot Menu

Boot Configuration:

Description: This feature enables the user to specify which devices are boot devices and the order of priority from which the systems boots up during startup.

```

Aptio Setup Utility - Copyright (C) 2013 American Megatrends, Inc.
Main  Advanced  Chipset  Security  Boot  Save & Exit

Boot Configuration
Setup Prompt Timeout          1
Bootup NumLock State         [On]

Quiet Boot                     [Enabled]

Boot Option Priorities
Boot Option #1                [UEFI: Built-in EFI
                             Shell ]
Boot Option #2                [UEFI: ADATA USB Flash
                             Drive 1.00]
Boot Option #3                [ADATA USB Flash Drive
                             1.00]

Hard Drive BBS Priorities

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

+*: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit

Version 2.16.1243. Copyright (C) 2013 American Megatrends, Inc.
  
```

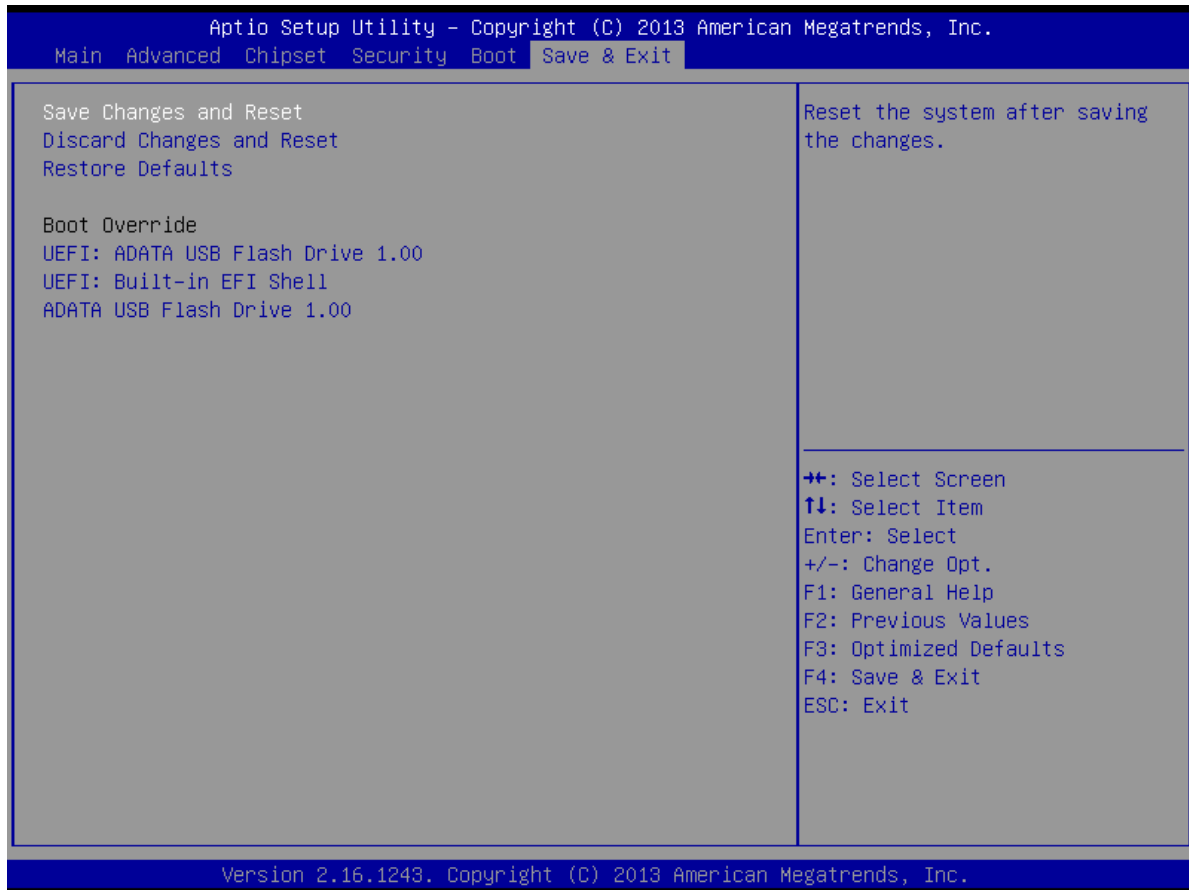
### 3.6 Save & Exit Menu

**Description:**

**Save Change and Reset:** When you have completed the system configuration changes, select this option to leave the BIOS Setup Utility and reboot the computer, so the new system configuration parameters can take effect. Select Save Changes and Exit from the Exit menu and press <Enter>.

**Discard Changes and Reset:** Select this option to quit the BIOS Setup without making any permanent changes to the system configuration and reboot the computer. Select Discard Changes and Exit from the Exit menu and press <Enter>.

**Restored Defaults:** To set this feature, select Restore Defaults from the Exit menu and press <Enter>. These are factory settings designed for maximum system stability, but not for maximum performance.



## 4. Design Resources

### 4.1 System Resources

<b>Resource</b>	<b>Share</b>	<b>Device Descriptions</b>
DMA 04	Exclusive	Direct memory access controller
IRQ 00	Exclusive	System timer
IRQ 01	Exclusive	Standard PS/2 Keyboard
IRQ 03	Exclusive	Communications Port (COM1)
IRQ 04	Exclusive	Communications Port (COM1)
IRQ 07	Shared	Communications Port (COM2)
IRQ 07	Shared	Communications Port (COM3)
IRQ 08	Exclusive	System CMOS/real time clock
IRQ 100	Exclusive	Microsoft ACPI-Compliant System
IRQ 101	Exclusive	Microsoft ACPI-Compliant System
IRQ 102	Exclusive	Microsoft ACPI-Compliant System
IRQ 103	Exclusive	Microsoft ACPI-Compliant System
IRQ 104	Exclusive	Microsoft ACPI-Compliant System
IRQ 105	Exclusive	Microsoft ACPI-Compliant System
IRQ 106	Exclusive	Microsoft ACPI-Compliant System
IRQ 107	Exclusive	Microsoft ACPI-Compliant System
IRQ 108	Exclusive	Microsoft ACPI-Compliant System
IRQ 109	Exclusive	Microsoft ACPI-Compliant System
IRQ 11	Shared	Ethernet Controller
IRQ 11	Shared	Ethernet Controller
IRQ 11	Shared	PCI Simple Communications Controller
IRQ 11	Shared	SM Bus Controller
IRQ 11	Shared	Universal Serial Bus (USB) Controller
IRQ 110	Exclusive	Microsoft ACPI-Compliant System
IRQ 111	Exclusive	Microsoft ACPI-Compliant System





IRQ 112	Exclusive	Microsoft ACPI-Compliant System
IRQ 113	Exclusive	Microsoft ACPI-Compliant System
IRQ 114	Exclusive	Microsoft ACPI-Compliant System
IRQ 115	Exclusive	Microsoft ACPI-Compliant System
IRQ 116	Exclusive	Microsoft ACPI-Compliant System
IRQ 117	Exclusive	Microsoft ACPI-Compliant System
IRQ 118	Exclusive	Microsoft ACPI-Compliant System
IRQ 119	Exclusive	Microsoft ACPI-Compliant System
IRQ 12	Exclusive	Microsoft PS/2 Mouse
IRQ 120	Exclusive	Microsoft ACPI-Compliant System
IRQ 121	Exclusive	Microsoft ACPI-Compliant System
IRQ 122	Exclusive	Microsoft ACPI-Compliant System
IRQ 123	Exclusive	Microsoft ACPI-Compliant System
IRQ 124	Exclusive	Microsoft ACPI-Compliant System
IRQ 125	Exclusive	Microsoft ACPI-Compliant System
IRQ 126	Exclusive	Microsoft ACPI-Compliant System
IRQ 127	Exclusive	Microsoft ACPI-Compliant System
IRQ 128	Exclusive	Microsoft ACPI-Compliant System
IRQ 129	Exclusive	Microsoft ACPI-Compliant System
IRQ 130	Exclusive	Microsoft ACPI-Compliant System
IRQ 131	Exclusive	Microsoft ACPI-Compliant System
IRQ 131071	Exclusive	PCI Express standard Root Port
IRQ 132	Exclusive	Microsoft ACPI-Compliant System
IRQ 133	Exclusive	Microsoft ACPI-Compliant System
IRQ 134	Exclusive	Microsoft ACPI-Compliant System
IRQ 135	Exclusive	Microsoft ACPI-Compliant System
IRQ 136	Exclusive	Microsoft ACPI-Compliant System
IRQ 137	Exclusive	Microsoft ACPI-Compliant System
IRQ 138	Exclusive	Microsoft ACPI-Compliant System
IRQ 139	Exclusive	Microsoft ACPI-Compliant System
IRQ 140	Exclusive	Microsoft ACPI-Compliant System
IRQ 141	Exclusive	Microsoft ACPI-Compliant System



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IRQ 142	Exclusive	Microsoft ACPI-Compliant System
IRQ 143	Exclusive	Microsoft ACPI-Compliant System
IRQ 144	Exclusive	Microsoft ACPI-Compliant System
IRQ 145	Exclusive	Microsoft ACPI-Compliant System
IRQ 146	Exclusive	Microsoft ACPI-Compliant System
IRQ 147	Exclusive	Microsoft ACPI-Compliant System
IRQ 148	Exclusive	Microsoft ACPI-Compliant System
IRQ 149	Exclusive	Microsoft ACPI-Compliant System
IRQ 150	Exclusive	Microsoft ACPI-Compliant System
IRQ 151	Exclusive	Microsoft ACPI-Compliant System
IRQ 152	Exclusive	Microsoft ACPI-Compliant System
IRQ 153	Exclusive	Microsoft ACPI-Compliant System
IRQ 154	Exclusive	Microsoft ACPI-Compliant System
IRQ 155	Exclusive	Microsoft ACPI-Compliant System
IRQ 156	Exclusive	Microsoft ACPI-Compliant System
IRQ 157	Exclusive	Microsoft ACPI-Compliant System
IRQ 158	Exclusive	Microsoft ACPI-Compliant System
IRQ 159	Exclusive	Microsoft ACPI-Compliant System
IRQ 16	Shared	High Definition Audio Controller
IRQ 160	Exclusive	Microsoft ACPI-Compliant System
IRQ 161	Exclusive	Microsoft ACPI-Compliant System
IRQ 162	Exclusive	Microsoft ACPI-Compliant System
IRQ 163	Exclusive	Microsoft ACPI-Compliant System
IRQ 164	Exclusive	Microsoft ACPI-Compliant System
IRQ 165	Exclusive	Microsoft ACPI-Compliant System
IRQ 166	Exclusive	Microsoft ACPI-Compliant System
IRQ 167	Exclusive	Microsoft ACPI-Compliant System
IRQ 168	Exclusive	Microsoft ACPI-Compliant System
IRQ 169	Exclusive	Microsoft ACPI-Compliant System
IRQ 170	Exclusive	Microsoft ACPI-Compliant System
IRQ 171	Exclusive	Microsoft ACPI-Compliant System
IRQ 172	Exclusive	Microsoft ACPI-Compliant System



IRQ 173	Exclusive	Microsoft ACPI-Compliant System
IRQ 174	Exclusive	Microsoft ACPI-Compliant System
IRQ 175	Exclusive	Microsoft ACPI-Compliant System
IRQ 176	Exclusive	Microsoft ACPI-Compliant System
IRQ 177	Exclusive	Microsoft ACPI-Compliant System
IRQ 178	Exclusive	Microsoft ACPI-Compliant System
IRQ 179	Exclusive	Microsoft ACPI-Compliant System
IRQ 180	Exclusive	Microsoft ACPI-Compliant System
IRQ 181	Exclusive	Microsoft ACPI-Compliant System
IRQ 182	Exclusive	Microsoft ACPI-Compliant System
IRQ 183	Exclusive	Microsoft ACPI-Compliant System
IRQ 184	Exclusive	Microsoft ACPI-Compliant System
IRQ 185	Exclusive	Microsoft ACPI-Compliant System
IRQ 186	Exclusive	Microsoft ACPI-Compliant System
IRQ 187	Exclusive	Microsoft ACPI-Compliant System
IRQ 188	Exclusive	Microsoft ACPI-Compliant System
IRQ 189	Exclusive	Microsoft ACPI-Compliant System
IRQ 19	Shared	Standard AHCI 1.0 Serial ATA Controller
IRQ 190	Exclusive	Microsoft ACPI-Compliant System
IRQ 22	Shared	High Definition Audio Controller
IRQ 23	Shared	Standard Enhanced PCI to USB Host Controller
IRQ 81	Exclusive	Microsoft ACPI-Compliant System
IRQ 82	Exclusive	Microsoft ACPI-Compliant System
IRQ 83	Exclusive	Microsoft ACPI-Compliant System
IRQ 84	Exclusive	Microsoft ACPI-Compliant System
IRQ 85	Exclusive	Microsoft ACPI-Compliant System
IRQ 86	Exclusive	Microsoft ACPI-Compliant System
IRQ 87	Exclusive	Microsoft ACPI-Compliant System
IRQ 88	Exclusive	Microsoft ACPI-Compliant System
IRQ 89	Exclusive	Microsoft ACPI-Compliant System
IRQ 90	Exclusive	Microsoft ACPI-Compliant System
IRQ 91	Exclusive	Microsoft ACPI-Compliant System



IRQ 92	Exclusive	Microsoft ACPI-Compliant System
IRQ 93	Exclusive	Microsoft ACPI-Compliant System
IRQ 94	Exclusive	Microsoft ACPI-Compliant System
IRQ 95	Exclusive	Microsoft ACPI-Compliant System
IRQ 96	Exclusive	Microsoft ACPI-Compliant System
IRQ 97	Exclusive	Microsoft ACPI-Compliant System
IRQ 98	Exclusive	Microsoft ACPI-Compliant System
IRQ 99	Exclusive	Microsoft ACPI-Compliant System
Memory 000A0000-000BFFFF	Shared	Standard VGA Graphics Adapter
Memory 000A0000-000BFFFF	Shared	PCI bus
Memory DF800000-FEAFFFFF	Shared	PCI bus
Memory E0000000-EFFFFFFF	Exclusive	Standard VGA Graphics Adapter
Memory F6000000-F6FFFFFF	Exclusive	Standard VGA Graphics Adapter
Memory F7000000-F701FFFF	Exclusive	Ethernet Controller
Memory F7000000-F70FFFFF	Exclusive	PCI Express standard Root Port
Memory F7020000-F7023FFF	Exclusive	Ethernet Controller
Memory F7100000-F711FFFF	Exclusive	Ethernet Controller
Memory F7120000-F712FFFF	Exclusive	Universal Serial Bus (USB) Controller
Memory F7130000-F7133FFF	Exclusive	High Definition Audio Controller
Memory F7134000-F7137FFF	Exclusive	High Definition Audio Controller
Memory F7138000-F71380FF	Exclusive	SM Bus Controller
Memory F7139000-F71397FF	Exclusive	Standard AHCI 1.0 Serial ATA Controller
Memory F713A000-F713A3FF	Exclusive	Standard Enhanced PCI to USB Host Controller
Memory F713B000-F713BFFF	Exclusive	Ethernet Controller
Memory F713E000-F713E01F	Exclusive	PCI Simple Communications Controller
Memory F7FE0000-F7FEFFFF	Exclusive	Motherboard resources
Memory F7FF0000-F7FFFFFF	Exclusive	Motherboard resources
Memory F8000000-FBFFFFFF	Exclusive	Motherboard resources
Memory FED00000-FED003FF	Exclusive	High precision event timer
Memory FED10000-FED17FFF	Exclusive	Motherboard resources
Memory FED18000-FED18FFF	Exclusive	Motherboard resources
Memory FED19000-FED19FFF	Exclusive	Motherboard resources

Memory FED1C000-FED1FFFF	Exclusive	Motherboard resources
Memory FED20000-FED3FFFF	Exclusive	Motherboard resources
Memory FED45000-FED8FFFF	Exclusive	Motherboard resources
Memory FED90000-FED93FFF	Exclusive	Motherboard resources
Memory FEE00000-FEEFFFFF	Exclusive	Motherboard resources
Memory FF000000-FFFFFFFF	Exclusive	Intel(R) 82802 Firmware Hub Device
Memory FF000000-FFFFFFFF	Exclusive	Motherboard resources
Port 0000-001F	Exclusive	Direct memory access controller
Port 0000-0CF7	Shared	PCI bus
Port 0020-0021	Exclusive	Programmable interrupt controller
Port 0024-0025	Exclusive	Programmable interrupt controller
Port 0028-0029	Exclusive	Programmable interrupt controller
Port 002C-002D	Exclusive	Programmable interrupt controller
Port 002E-002F	Exclusive	Motherboard resources
Port 0030-0031	Exclusive	Programmable interrupt controller
Port 0034-0035	Exclusive	Programmable interrupt controller
Port 0038-0039	Exclusive	Programmable interrupt controller
Port 003C-003D	Exclusive	Programmable interrupt controller
Port 0040-0043	Exclusive	System timer
Port 004E-004F	Exclusive	Motherboard resources
Port 0050-0053	Exclusive	System timer
Port 0060-0060	Exclusive	Standard PS/2 Keyboard
Port 0061-0061	Exclusive	Motherboard resources
Port 0063-0063	Exclusive	Motherboard resources
Port 0064-0064	Exclusive	Standard PS/2 Keyboard
Port 0065-0065	Exclusive	Motherboard resources
Port 0067-0067	Exclusive	Motherboard resources
Port 0070-0070	Exclusive	Motherboard resources
Port 0070-0077	Exclusive	System CMOS/real time clock
Port 0080-0080	Exclusive	Motherboard resources
Port 0081-0091	Exclusive	Direct memory access controller
Port 0092-0092	Exclusive	Motherboard resources



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Port 0093-009F	Exclusive	Direct memory access controller
Port 00A0-00A1	Exclusive	Programmable interrupt controller
Port 00A4-00A5	Exclusive	Programmable interrupt controller
Port 00A8-00A9	Exclusive	Programmable interrupt controller
Port 00AC-00AD	Exclusive	Programmable interrupt controller
Port 00B0-00B1	Exclusive	Programmable interrupt controller
Port 00B2-00B3	Exclusive	Motherboard resources
Port 00B4-00B5	Exclusive	Programmable interrupt controller
Port 00B8-00B9	Exclusive	Programmable interrupt controller
Port 00BC-00BD	Exclusive	Programmable interrupt controller
Port 00C0-00DF	Exclusive	Direct memory access controller
Port 02E8-02EF	Exclusive	Communications Port (COM3)
Port 02F8-02FF	Exclusive	Communications Port (COM1)
Port 03B0-03BB	Shared	Standard VGA Graphics Adapter
Port 03C0-03DF	Shared	Standard VGA Graphics Adapter
Port 03E8-03EF	Exclusive	Communications Port (COM2)
Port 03F8-03FF	Exclusive	Communications Port (COM1)
Port 04D0-04D1	Exclusive	Programmable interrupt controller
Port 0680-069F	Exclusive	Motherboard resources
Port 0A00-0A0F	Exclusive	Motherboard resources
Port 0A10-0A1F	Exclusive	Motherboard resources
Port 0A20-0A2F	Exclusive	Motherboard resources
Port 0D00-FFFF	Shared	PCI bus
Port 164E-164F	Exclusive	Motherboard resources
Port 1800-18FE	Exclusive	Motherboard resources
Port 1854-1857	Exclusive	Motherboard resources
Port E000-E01F	Exclusive	Ethernet Controller
Port E000-EFFF	Exclusive	PCI Express standard Root Port
Port F000-F03F	Exclusive	Standard VGA Graphics Adapter
Port F040-F05F	Exclusive	SM Bus Controller
Port F060-F07F	Exclusive	Standard AHCI 1.0 Serial ATA Controller
Port F080-F09F	Exclusive	Ethernet Controller



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Port F0A0-F0A3	Exclusive	Standard AHCI 1.0 Serial ATA Controller
Port F0B0-F0B7	Exclusive	Standard AHCI 1.0 Serial ATA Controller
Port F0C0-F0C3	Exclusive	Standard AHCI 1.0 Serial ATA Controller
Port F0D0-F0D7	Exclusive	Standard AHCI 1.0 Serial ATA Controller
Port FFFF-FFFF	Exclusive	Motherboard resources
Port FFFF-FFFF	Exclusive	Motherboard resources
Port FFFF-FFFF	Exclusive	Motherboard resources



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