USER MANUAL

EPIA-E900

Pico-ITXe board

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Regulatory Compliance

FCC-A Radio Frequency Interference Statement

This equipment has been tested and found to comply with the limits for a class A digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his personal expense.

Notice 1

The changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Notice 2

Shielded interface cables and A.C. power cord, if any, must be used in order to comply with the emission limits.

Notice 3

The product described in this document is designed for general use, VIA Technologies assumes no responsibility for the conflicts or damages arising from incompatibility of the product. Check compatibility issue with your local sales representatives before placing an order.

Tested To Comply
With FCC Standards
FOR HOME OR OFFICE USE

Battery Recycling and Disposal

- ☐ Only use the appropriate battery specified for this product.
- ☐ Do not re-use, recharge, or reheat an old battery.
- ☐ Do not attempt to force open the battery.
- ☐ Do not discard used batteries with regular trash.
- ☐ Discard used batteries according to local regulations.

Safety Precautions

- ☐ Always read the safety instructions carefully.
- ☐ Keep this User's Manual for future reference.
- ☐ All cautions and warnings on the equipment should be noted.
- ☐ Keep this equipment away from humidity.
- ☐ Lay this equipment on a reliable flat surface before setting it up.
- ☐ Make sure the voltage of the power source and adjust properly 110/220V before connecting the equipment to the power inlet.
- ☐ Place the power cord in such a way that people cannot step on it.
- ☐ Always unplug the power cord before inserting any add-on card or module.
- ☐ If any of the following situations arises, get the equipment checked by authorized service personnel:
  - The power cord or plug is damaged.
  - Liquid has penetrated into the equipment.
  - The equipment has been exposed to moisture.
  - The equipment has not worked well or you cannot get it work according to User's Manual.
  - The equipment has dropped and damaged.
  - The equipment has obvious sign of breakage.
- ☐ Do not leave this equipment in an environment unconditioned or in a storage temperature above 60°C (140°F). The equipment may be damaged.
- ☐ Do not leave this equipment in direct sunlight.
- ☐ Never pour any liquid into the opening. Liquid can cause damage or electrical shock.
- ☐ Do not place anything over the power cord.
- ☐ Do not cover the ventilation holes. The openings on the enclosure protect the equipment from overheating

Box Contents

EPIA-E900-12QE

- ☐ 1 x EPIA-E900 board
- ☐ 1 x SATA cable
- ☐ 1 x SATA power cable
- ☐ 1 x DC-in power cable

Ordering Information

Part Number	Description
EPIA-E900-12QE	Pico-ITXe board with 1.2GHz VIA Eden® X4 processor, Mini HDMI, 2 x USB 3.0, 2 x USB 2.0, 2 x COM, 2 x Gigabit Ethernet, SATA and 12V DC-in

Optional Accessories

Wireless Accessories

Part Number	Description
00GO27100BU2B0D0	VNT9271 IEEE 802.11b/g/n USB Wi-Fi dongle
EMIO-1533-00A2	VNT9271 IEEE 802.11b/g/n USB Wi-Fi module with assembly kit and antenna.
EMIO-5531-00A1	VAB-820-W IEEE 802.11b/g/n USB Wi-Fi & Bluetooth module with assembly kit and antenna.

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1. Product Overview

The EPIA-E900 is a highly integrated Pico-ITXe board powered by a 1.2GHz VIA Eden® X4 processor and VIA VX11H MSP chipset that delivers a high performance and rich multimedia features in an ultra-compact package for a wide range of embedded system applications such as industrial automation, transportation, medical, and infotainment.

The EPIA-E900 board is fully compatible with Microsoft® and Linux operating systems, and provides an impressive I/O such as COM ports, mini HDMI® port, Gigabit Ethernet ports, USB 2.0 ports, USB 3.0 ports, SATA connector for storage devices, and onboard MXM connector for an optional E900-A expansion card. In addition, EPIA-E900 also includes one DDR3 1333 SODIMM slot that support up to 8GB memory size.

1.1. Key Features and Benefits

1.1.1. VIA Eden® X4 Processor

The VIA Eden® X4 is a 64-bit superscalar x86 multi-core processor combine on two dies. It is based on advanced 28 nanometer process technology packed into an ultra compact NanoBGA2 package measuring 21mm x 21mm. The VIA Eden® X4 processor delivers a superb performance on multi-tasking, multimedia playback, productivity and internet browsing in a low power budget. In addition, it is ideal for most of multi-display environment, and embedded system applications.

Note:

For Windows 7 and Windows Server 2008 R2 users only:
If the user encounters the issue such as the operating system recognizing the VIA Dual-Core CPU as two processors instead of one processor with two cores, Please download and install the hotfix released by Microsoft to address this issue.
The downloadable hotfix is available at http://support.microsoft.com/kb/2502664

1.1.2. VIA VX11H MSP Chipset

The VIA VX11H is the fourth generation, highly integrated Media System Processor which provides high quality digital video streaming and high definition video playback. It features the VIA C-640 DX11 3D/2D graphics and video processor, High Definition video decoder supports DDR3 1333 controller and USB 3.0 interface.

The VIA VX11H offers superb-graphics performance, immersive visual experience, and supports DirectX 11.0 that allows realistic 3D rendering and increased visual acuity. The VIA VX11H is based on a highly sophisticated power efficient architecture that enables such rich integration into a compact package.

1.1.3. Expansion Option

The EPIA-E900 further proves its versatility by providing an expansion MXM connector for optional E900-A expansion card. The E900-A expansion card is carrying multiple expansion I/O such as audio jack, USB 2.0 ports, SATA connector, PCIe slot, LVDS panel connector, DisplayPort/HDMI port, DVP port and etc.
The companies using the EPIA-E900 with E900-A expansion card obtain the maximum benefits and enable to slowly roll out upgrades as necessary instead of having to replace everything all at once.

1.2. Product Specifications

- **Processor**
  - 1.2GHz VIA Eden® X4
    - 21mm x 21mm FCBGA
- **Chipset**
  - VIA VX11H MSP chipset
    - 33mm x 33mm FCBGA
- **Graphics**
  - Integrated C-640 DX11 3D/2D graphics and video processor with MPEG-2, WMV9, VC1, and H.264 video decoding acceleration
- **System Memory**
  - 1 x DDR3 1333 SODIMM slot
  - Supports up to 8GB memory size
- **BIOS**
  - AMI Aptio UEFI BIOS, 32Mbit flash memory
- **Onboard Peripherals**
  - **Serial ATA**
    - Supports up to 3Gbps
  - **LAN**
    - 2 x Realtek RTL8111G PCIe Gigabit Ethernet controllers
  - **Audio**
    - Through MXM support
  - **Super I/O**
    - Fintek F81801U-I Super I/O controller
- **Onboard I/O Connectors**
  - 1 x DC-in connector
  - 1 x SATA connector
  - 1 x SATA power connector
  - 1 x MXM connector
  - 1 x SPI pin header
  - 1 x CPU fan connector
  - 1 x Clear CMOS jumper
  - 1 x AT/ATX jumper pin header
  - 1 x LPC connector
  - 1 x USB 2.0 connector (support EMIO-1533 & EMIO-5531 module)
  - 1 x CMOS battery connector

- Front Panel I/O
  - 1 x HDD LED
  - 1 x Power LED
  - 1 x Power button
  - 2 x USB 3.0 ports
  - 2 x COM ports

- Back Panel I/O
  - 2 x Gigabit Ethernet ports
  - 1 x Mini HDMI® port (Type C)
  - 2 x USB 2.0 ports

- MXM Connector interface
  - Supports one SATA connector
  - Supports four USB 2.0 ports
  - Supports one DisplayPort/HDMI interface
  - Supports DVP interface
  - Supports single-channel 18/24-bits LVDS panel interface
  - Supports LPC interface
  - Supports SMBus interface
  - Supports SPI interface
  - Supports one Digital I/O (3GPI + 3GPO) interface
  - Supports HD Audio interface
  - Supports one fan controller for System fan
  - Supports one PCIe x4 interface

- Supported Operating System
  - Microsoft Windows 10
  - Microsoft Windows 8.1
  - Microsoft Windows 8
  - Microsoft Windows 7
  - Microsoft Windows Embedded Standard 7
  - Linux

- System Monitoring & Management
  - Wake-on-LAN
  - Keyboard-Power-on
  - Timer-Power-on
  - System Power Management
  - AC power failure recovery
  - Watchdog Timer

- Operating Conditions
  - Operating Temperature
    - 0°C ~55°C
  - Operating Humidity
    - 0% ~ 95% (relative humidity; non-condensing)

- Form Factor
  - Pico-ITXe (13.8cm x 7.2cm)

- Compliance
  - CE
  - FCC

Note:

As the operating temperature provided in the specifications is a result of the test performed in VIA's chamber, a number of variables can influence this result. Please note that the working temperature may vary depending on the actual situation and environment. It is highly suggested to execute a solid testing program and take all the variables into consideration when building the system. Please ensure that the system runs well under the operating temperature in terms of application.

1.3. Layout Diagram

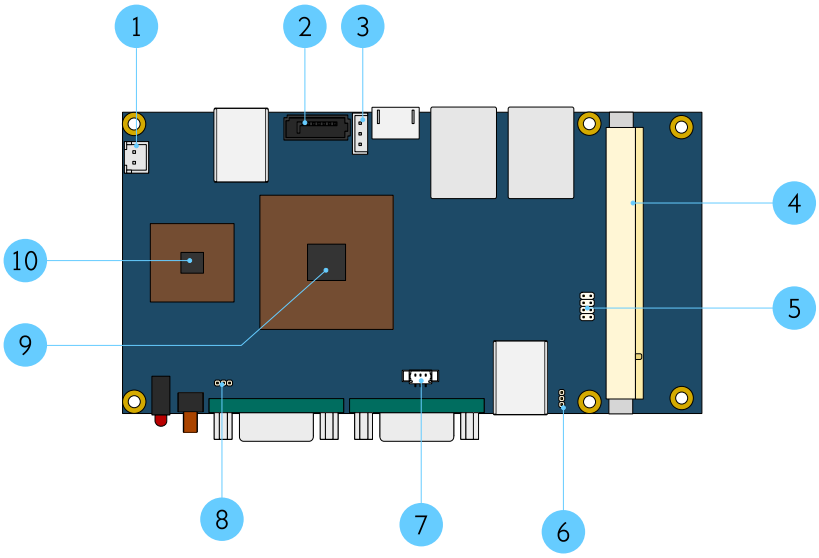

Figure 1: Top side layout diagram

Item	Description
1	PWR: DC-in connector
2	SATA: SATA connector
3	SATA_PW: SATA power connector
4	MXM: MXM connector
5	SPI: SPI pin header
6	CLEAR_CMOS: Clear CMOS jumper
7	CPUFAN: CPU fan connector
8	AT/ATX: AT/ATX mode jumper
9	Chipset: VIA VX11H MSP
10	CPU: 1.2GHz VIA Eden X4 processor

Table 1: Top side layout description table

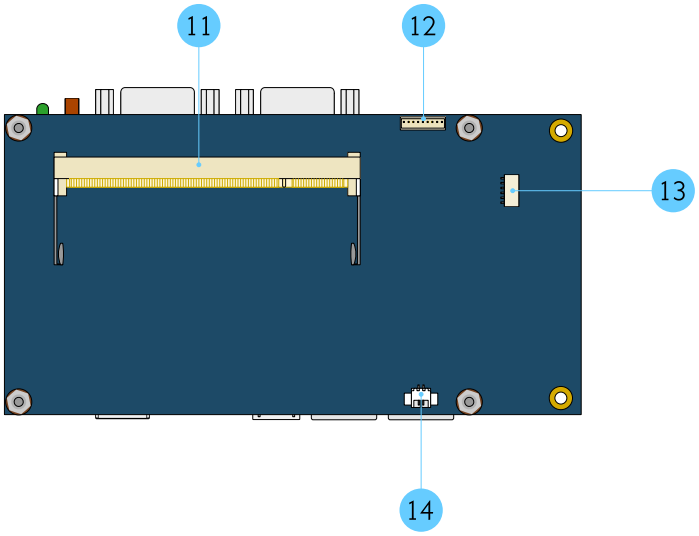

Figure 2: Bottom side layout diagram

Item	Description
11	SODIMM: DDR3 SODIMM slot
12	LPC: LPC connector
13	JWLAN: USB 2.0 connector
14	CMOS battery connector

Table 2: Bottom side layout description table

1.4. Dimensions

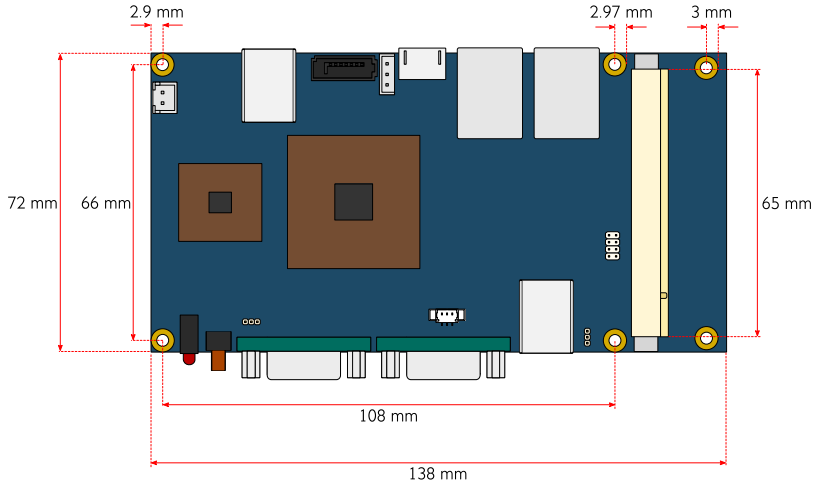

Figure 3: Top side dimensions (without heatsink) diagram

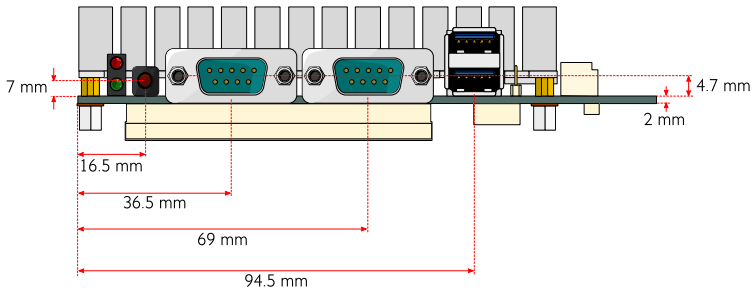

Figure 4: Front panel side dimensions diagram

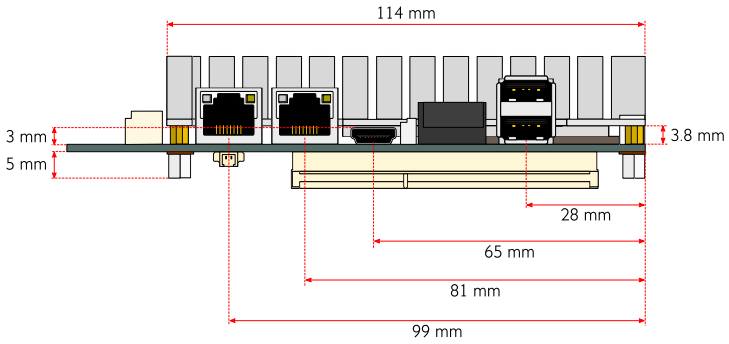

Figure 5: Back panel side dimensions diagram

1.5. Height Distribution

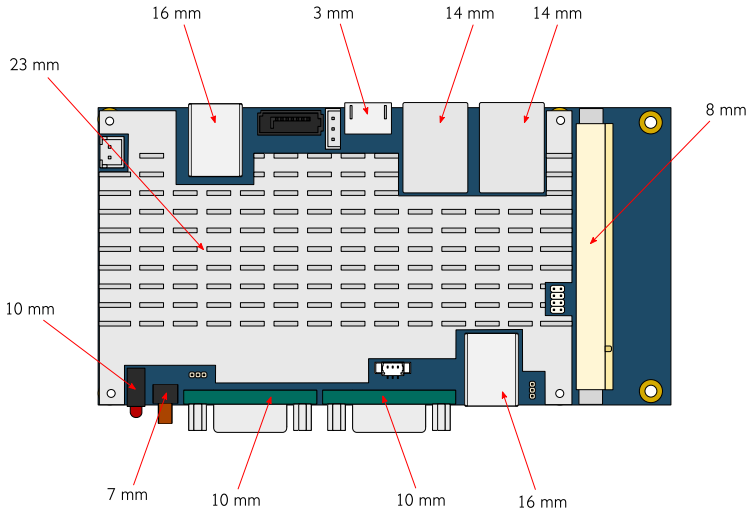

Figure 6: Top side height distribution diagram

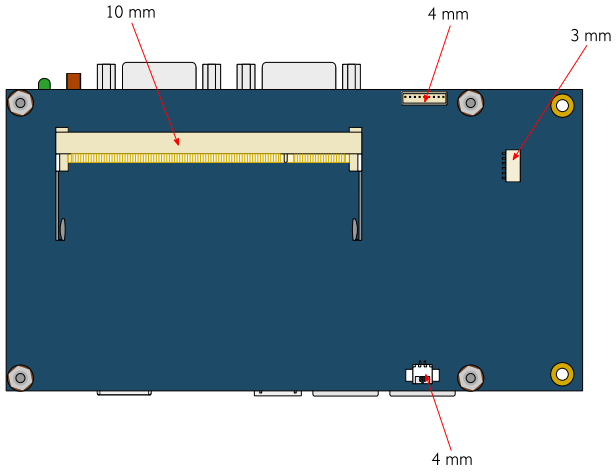

Figure 7: Bottom side height distribution diagram

2. I/O Interface

The VIA EPIA-E900 has a wide selection of interfaces. It includes a selection of frequently used ports as part of the external I/O coastline.

2.1. External I/O Ports

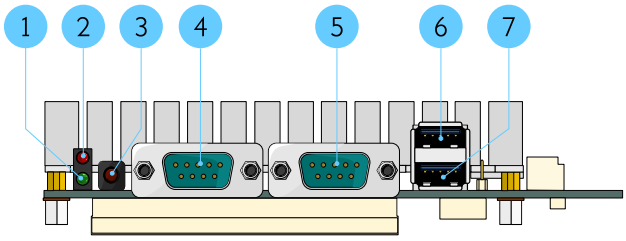

Figure 8: Front panel I/O diagram

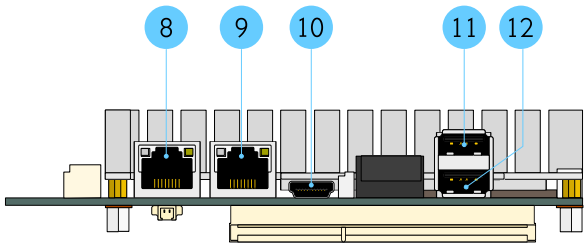

Figure 9: Back Panel I/O diagram

Item	Description
1	Power status LED
2	HDD LED
3	Power button
4	COM port 1
5	COM port 2
6	USB 3.0 port 1
7	USB 3.0 port 2
8	Gigabit Ethernet port 1
9	Gigabit Ethernet port 2
10	Mini HDMI® port
11	USB 2.0 port 1
12	USB 2.0 port 2

Table 3: Layout description table of external I/O ports

2.1.1. LED Indicators

There are two LEDs on the front panel that indicates the status of the system:

- HDD LED flashes in red and indicates hard drive storage activity for SATA drive.
- Power Status LED flashes in green and indicates the system's power status.

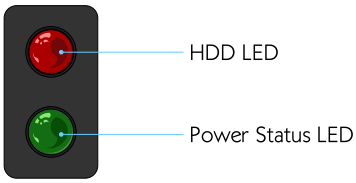

Figure 10: LED indicators diagram

2.1.2. Power Button

The EPIA-E900 comes with a power button that supports Soft power On/Off (Instant Off or 4 second delay), and Suspend.

Figure 11: Power button diagram

2.1.3. COM Port

The EPIA-E900 provides two COM (D-sub 9-pin male) ports located on the front panel. The COM ports labeled as COM1 and COM2 supports RS-232 standard. The pinout of the COM ports are shown below.

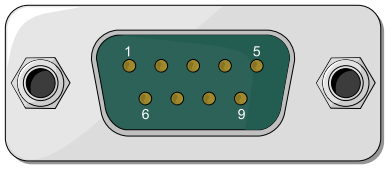

Figure 12: COM port diagram

COM 1	
Pin	Signal
1	COM_DCD1
2	COM_RXD1
3	COM_TXD1
4	COM_DTR1
5	GND
6	COM_DSR1
7	COM_RTS1
8	COM_CTS1
9	COM_RI1

COM 2	
Pin	Signal
1	COM_DCD2
2	COM_RXD2
3	COM_TXD2
4	COM_DTR2
5	GND
6	COM_DSR2
7	COM_RTS2
8	COM_CTS2
9	COM_RI2

Table 4: COM port pinouts

2.1.4. USB 3.0 Port

There are two USB 3.0 ports also known as SuperSpeed USB located on the front panel. The USB 3.0 port has a maximum data transfer rate up to 5Gbps and offers a backwards compatible with previous USB 2.0 specifications. The USB 3.0 ports are using the USB Type-A receptacle connector. The pinout of the typical USB 3.0 port is shown below.

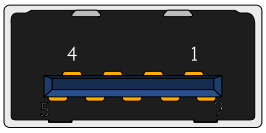

Figure 13: USB 3.0 port diagram

USB 3.0 port 1	
Pin	Signal
1	+5V
2	Data1-
3	Data1+
4	GND
5	RX1-
6	RX1+
7	GND
8	TX1-
9	TX1+

USB 3.0 port 2	
Pin	Signal
1	+5V
2	Data2-
3	Data2+
4	GND
5	RX2-
6	RX2+
7	GND
8	TX2-
9	TX2+

Table 5: USB 3.0 port pinouts

2.1.5. Gigabit Ethernet Port

The EPIA-E900 is equipped with two Gigabit Ethernet ports. The Gigabit Ethernet ports uses 8 Position 8 Contact (8P8C) receptacle connector or commonly referred to as RJ-45. It is fully compliant with IEEE 802.3 (10BASE-T), 802.3u (100BASE-TX), and 802.3ab (1000BASE-T) standards.

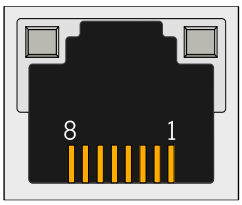

Figure 14: Gigabit Ethernet port diagram

Pin	Signal
1	Signal pair 1+
2	Signal pair 1-
3	Signal pair 2+
4	Signal pair 3+
5	Signal pair 3-
6	Signal pair 2-
7	Signal pair 4+
8	Signal pair 4-

Table 6: Gigabit Ethernet port pinout

The Gigabit Ethernet port has two individual LED indicators located on the front side to show its Active/Link status and Speed status.

	Link LED (Left LED on RJ-45 connector)	Active LED (Right LED on RJ-45 connector)
Link Off	Off	Off
Speed_10Mbit	Off	Flash in Yellow color
Speed_100Mbit	The LED is always On in Green color	Flash in Yellow color
Speed_1000Mbit	The LED is always On in Orange color	Flash in Yellow color

Table 7: Gigabit Ethernet LED color definition

2.1.6. Mini HDMI® Port

The integrated 19-pin Mini HDMI port uses an HDMI Type C receptacle connector as defined in the HDMI® specification. The Mini HDMI port is for connecting to HDMI® displays. The pinout of the Mini HDMI port is shown below.

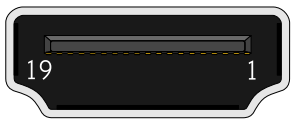

Figure 15: Mini HDMI® port diagram

Pin	Signal
1	TMDS Data2 Shield
2	TMDS Data2+
3	TMDS Data2-
4	TMDS Data1 Shield
5	TMDS Data1+
6	TMDS Data1-
7	TMDS Data0 Shield
8	TMDS Data0+
9	TMDS Data0-
10	TMDS Clock Shield
11	TMDS Clock+
12	TMDS Clock-
13	DDC/CEC Ground
14	CEC
15	SCL
16	SDA
17	Reserved
18	+5V Power
19	Hot Plug Detect

Table 8: Mini HDMI® port pinout

2.1.7. USB 2.0 Port

The EPIA-E900 provides two USB 2.0 ports that gives complete Plug and Play and hot swap capability for external devices. The USB interface complies with USB UHCI, Rev. 2.0. The pinout of the USB 2.0 port is shown below.

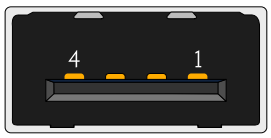

Figure 16: USB 2.0 port diagram

USB 2.0 port 1	
Pin	Signal
1	VCC
2	USB1 data-
3	USB1 data+
4	GND

USB 2.0 port 2	
Pin	Signal
1	VCC
2	USB2 data-
3	USB2 data+
4	GND

Table 9: USB 2.0 port pinouts

2.2. Onboard Connectors

2.2.1. DC-In Connector

The mainboard has an onboard DC-in 2-pin power connector to connect the DC-in power cable. The DC-in connector is labeled as "PWR". The pinout of the DC-in power connector is shown below.

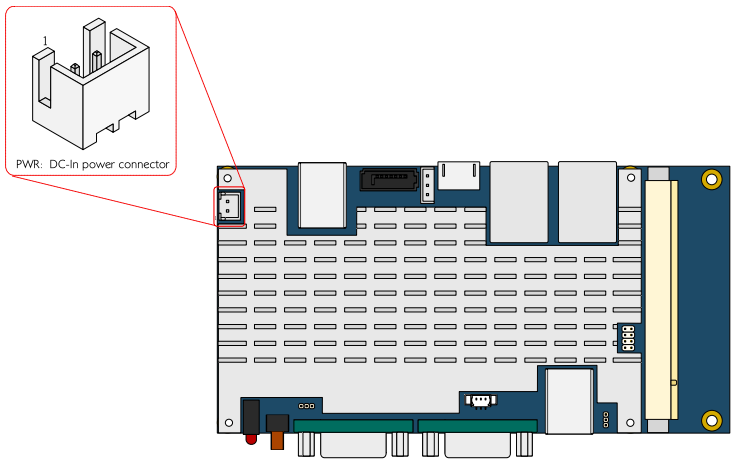

Figure 17: DC-in connector diagram

Pin	Signal
1	DC_+12V
2	GND

Table 10: DC-in connector pinout

2.2.2. SATA Connector

The SATA connector onboard can support up to 3 Gbps transfer speeds. The SATA connector is labeled as "SATA". The pinout of the SATA connector is shown below.

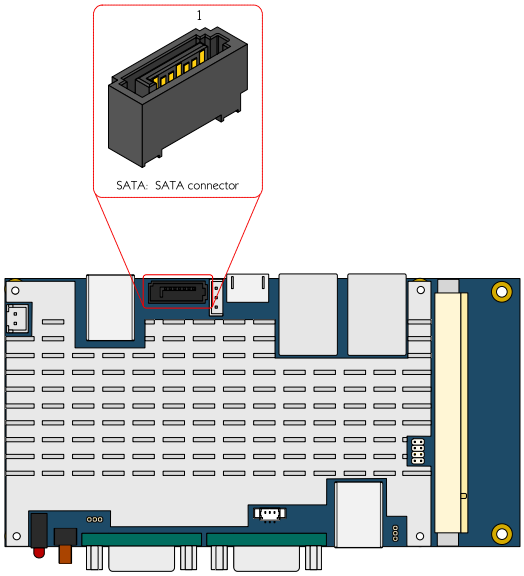

Figure 18: SATA connector diagram

Pin	Signal
1	GND
2	STXP_0
3	STXN_0
4	GND
5	SRXN_0
6	SRXP_0
7	GND

Table 11: SATA connector pinout

2.2.3. SATA Power Connector

The onboard SATA power connector provides both +5V and +12V directly through the mainboard to the SATA drives. The SATA power connector is labeled as "SATA_PW". The pinout of the SATA power connector is shown below.

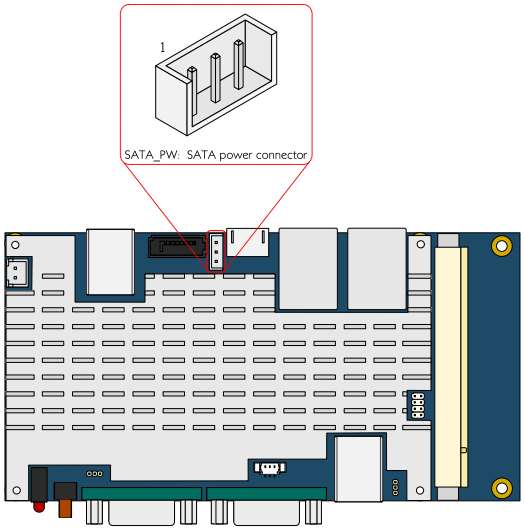

Figure 19: SATA power connector diagram

Pin	Signal
1	+5V
2	+12V
3	GND

Table 12: SATA power connector pinout

2.2.4. SPI Pin Header

The mainboard has one 8-pin SPI pin header. The SPI (Serial Peripheral Interface) pin header is used to connect to the SPI BIOS programming fixture. The pin header is labeled as "SPI". The pinout of the pin header is shown below.

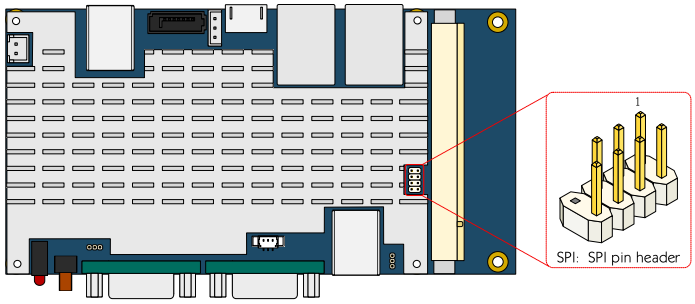

Figure 20: SPI pin header diagram

Pin	Signal	Pin	Signal
1	SPIVCC	2	GND
3	MSPI_SA	4	MSPICLK
5	MSPIDI	6	MSPIDO
7	—	8	-PCIRST

Table 13: SPI pin header pinout

2.2.5. CPU Fan Connector

The CPU fan connector onboard runs on +12V and maintain CPU cooling. The fan provides variable fan speeds controlled by the BIOS. The CPU fan connector is labeled as "CPUFAN". The pinout of the CPU fan connector is shown below.

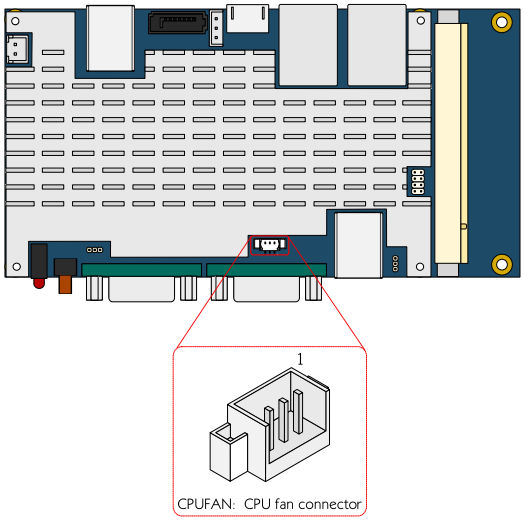

Figure 21: CPU fan connector diagram

Pin	Signal
1	FANIO
2	FAN_CTL
3	GND

Table 14: CPU fan connector pinout

2.2.6. CMOS Battery Connector

The mainboard is equipped with onboard CMOS battery connector used for connecting the external cable battery that provides power to the CMOS RAM. If disconnected all configurations in the CMOS RAM will be reset to factory defaults. The connector pinout is shown below.

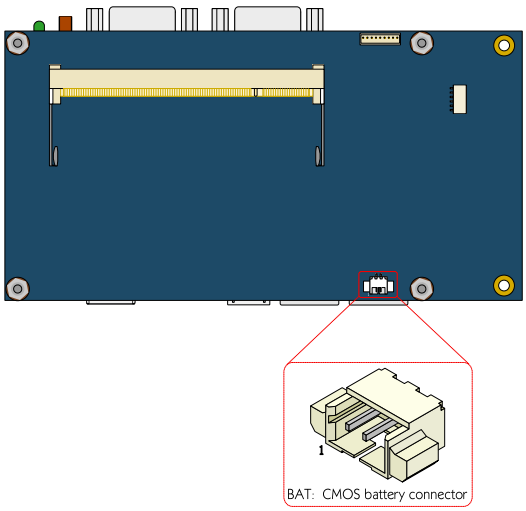

Figure 22: CMOS battery connector diagram

Pin	Signal
1	+3.3VBAT
2	GND

Table 15: CMOS battery connector pinout

2.2.7. USB 2.0 Connector

The EPIA-E900 is equipped with onboard USB 2.0 connector labeled as "JWLAN" for WLAN USB (Wi-Fi) module. The pinout of the USB 2.0 connector is shown below.

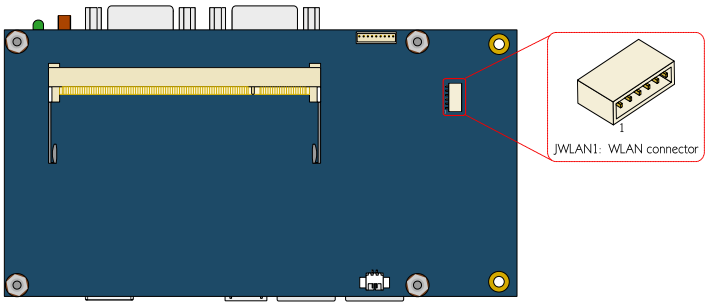

Figure 23: USB 2.0 connector diagram

Pin	Signal
1	+5VSUS
2	USBHP_N8
3	USBHP_P8
4	GND
5	NC
6	GPO-WLAN-ON

Table 16: USB 2.0 connector pinout

2.2.8. LPC Connector

The EPIA-E900 board has one LPC connector for debugging purposes. The connector is labeled as "LPC". The pinout of the connector is shown below.

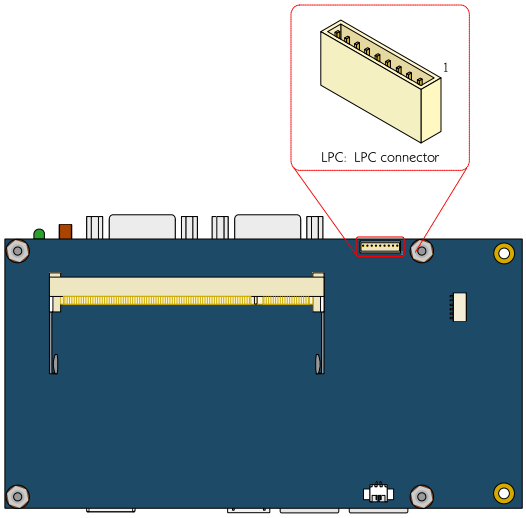

Figure 24: LPC connector diagram

Pin	Signal
1	GND
2	LPCAD2
3	LPCAD3
4	LPCAD1
5	-LPCFRAME
6	LPCAD0
7	LPC33CLK
8	-LPCRST
9	+3.3V

Table 17: LPC connector pinout

3. Jumpers

Jumper Description

A jumper consists of pair conductive pins used to close in or bypass an electronic circuit to set up or configure particular feature using a jumper cap. The jumper cap is a small metal clip covered by plastic. It performs like a connecting bridge to short (connect) the pair of pins. The usual colors of the jumper cap are black/red/blue/white/yellow.

Jumper Setting

There are two settings of the jumper pin: "**Short** and **Open**". The pins are "**Short"** when a jumper cap is placed on the pair of pins. The pins are **"Open"** if the jumper cap is removed.

In addition, there are jumpers that have three or more pins, and some pins are arranged in series. In case of a jumper with three pins, place the jumper cap on pin 1 and pin 2 or pin 2 and 3 to **Short** it.

Some jumper size is small or mounted on the crowded location on the board that makes it difficult to access. Therefore, using a long-nose plier in installing and removing the jumper cap is very helpful.

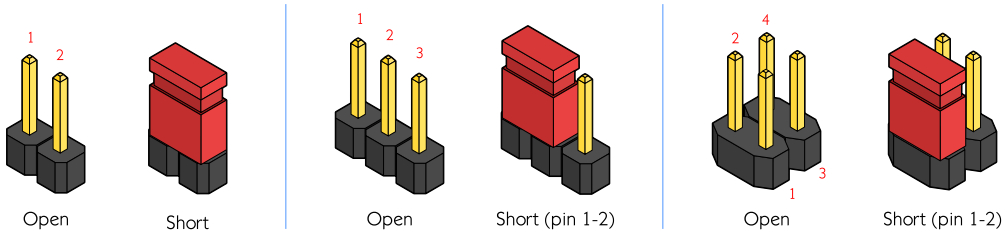

Figure 25: Jumper settings example

Caution:

Make sure to install the jumper cap on the correct pins. Installing it in the wrong pin might cause damage and malfunction.

3.1. Clear CMOS Jumper

The onboard CMOS RAM stores system configuration data and has an onboard battery power supply. To reset the CMOS settings, set the jumper on pins 2 and 3 while the system is off. Return the jumper to pins 1 and 2 afterwards. Setting the jumper while the system is on will damage the mainboard.

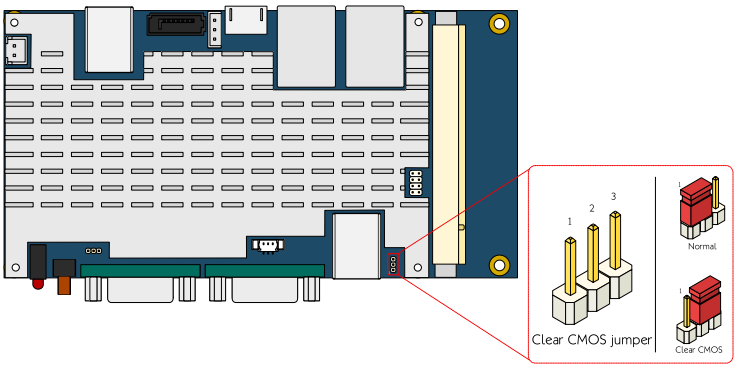

Figure 26: Clear CMOS jumper diagram

Setting	Pin 1	Pin 2	Pin 3
Normal (default)	Short	Short	Open
Clear CMOS	Open	Short	Short

Table 18: Clear CMOS jumper settings

Note:

Except when clearing the RTC RAM, never remove the cap from the CLEAR_CMOS jumper default position. Removing the cap will cause system boot failure. Avoid clearing the CMOS while the system is on; it will damage the mainboard.

3.2. AT/ATX Power Mode Select Jumper

The AT/ATX mode jumper enables the mainboard to switch between two power modes: AT and ATX. The power mode can set by changing the jumper position. The jumper is labeled as "AT/ATX". The jumper settings are shown below.

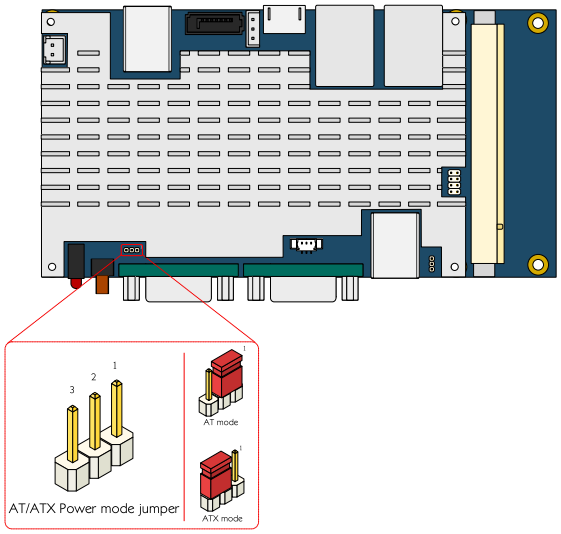

Figure 27: AT/ATX power mode select jumper diagram

Setting	Pin 1	Pin 2	Pin 3
AT mode	Short	Short	Open
ATX mode (default)	Open	Short	Short

Table 19: AT/ATX power mode select jumper settings

4. Expansion Connectors

4.1. MXM Connector

The MXM connector labeled as "MXM" is an onboard expansion connector for connecting E900-A expansion board to the mainboard. The location and pinout of the MXM connector are shown below.

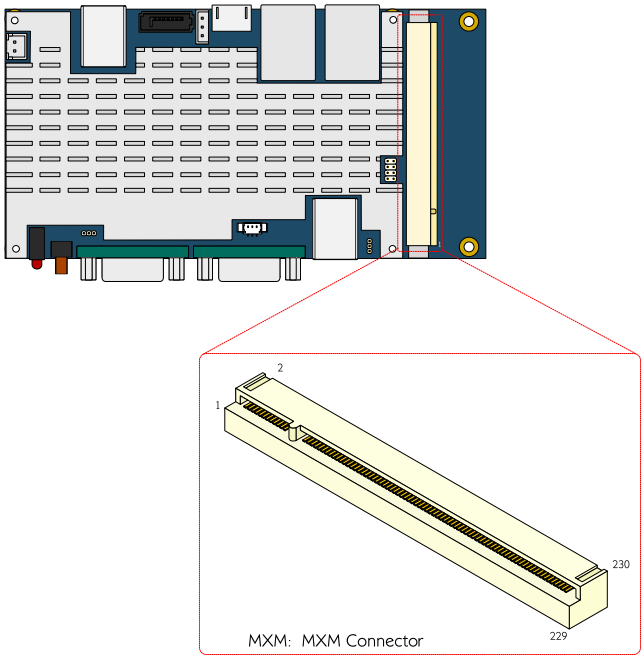

Figure 28: MXM connecter diagram

Pin	Signal	Pin	Signal
1	GND	2	GND
3	DVP_D0	4	DVP_D10
5	DVP_D1	6	DVP_D11
7	DVP_D2	8	DVP_HS
9	DVP_D3	10	DVP_VS
11	DVP_D4	12	DVP_DE
13	DVP_D5	14	DVP_CLK+
15	DVP_D6	16	DVP_CLK-
17	DVP_D7	18	LVDSPWM1
19	DVP_D8	20	DVP_SPD
21	DVP_D9	22	DVP_SPCLK
23	GND	24	GND
25	GND	26	NC
27	NC	28	NC
29	NC	30	STXP_1
31	NC	32	STXN_1
33	NC	34	GND
35	NC	36	SRXP_1
37	NC	38	SRXN_1
39	GND	40	GND
41	LPCAD0	42	LPCAD1
43	LPCAD2	44	LPCAD3

45	LPC33CLK	46	-LPCFRAME
47	SERIRQ	48	-LPCDRQ1
49	NC	50	NC
51	NC	52	NC
53	NC	54	NC
55	NC	56	NC
57	GND	58	GND
59	AZ_SYNC	60	SMB_CK
61	-AZ_RST	62	SMB_DT
63	AZ_BIT_CLK	64	NC
65	AZ_SDIN0	66	NC
67	AZ_SDOUT	68	NC
69	NC	70	NC
71	NC	72	NC
73	GND	74	GND
75	NC	76	NC
77	NC	78	NC
79	NC	80	NC
81	NC	82	NC
83	NC	84	NC
85	NC	86	NC
87	USBHP3-	88	USBHP2-
89	USBHP3+	90	USBHP2+
91	NC	92	NC
93	USBHP1-	94	USBHP0-
95	USBHP1+	96	USBHP0+
97	GND	98	GND
99	LVDS0D0+	100	NC
101	LVDS0D0-	102	NC
103	LVDS0D1+	104	NC
105	LVDS0D1-	106	NC
107	LVDS0D2+	108	NC
109	LVDS0D2-	110	NC
111	LVDSENVDD	112	LVDSENVEE
113	LVDS0D3+	114	NC
115	LVDS0D3-	116	NC
117	GND	118	GND
119	LVDS0CLK+	120	VX11_RI2
121	LVDS0CLK-	122	VX11_DCD2
123	LVDSPWM0	124	VX11_SOUT2
125	LVDSSPDAT	126	VX11_SIN2
127	LVDSSPCLK	128	VX11_CTS2
129	NC	130	VX11_DSR2
131	DP0TX3+	132	VX11_RTS2
133	DP0TX3-	134	VX11_DTR2
135	GND	136	GND
137	DP0TX1+	138	DP0_AUX+
139	DP0TX1-	140	DP0_AUX-
141	GND	142	GND
143	DP0TX2+	144	NC
145	DP0TX2-	146	NC
147	GND	148	GND

149	DP0TX0+	150	HDMI0SPD
151	DP0TX0-	152	HDMI0SPC
153	DP0_HPD	154	HDMI0_CEC
155	PCIE_CLK_REF+	156	-PEXWAKE
157	PCIE_CLK_REF-	158	-PEX1_RST
159	GND	160	GND
161	PETP3	162	PEXRX3+
163	PETN3	164	PEXRX3-
165	GND	166	GND
167	PETP2	168	PEXRX2+
169	PETN2	170	PEXRX2-
171	NC	172	NC
173	PETP1	174	PEXRX1+
175	PETN1	176	PEXRX1-
177	NC	178	NC
179	PETP0	180	PEXRX0+
181	PETN0	182	PEXRX0-
183	GND	184	GND
185	GPI6	186	GPO16
187	GPI22	188	GPO20
189	GPI23	190	GPO21
191	NC	192	NC
193	NC	194	SPKR
195	FANIO2	196	FAN_CTL2
197	GND	198	GND
199	MSPIDI	200	MSPISS0
201	MSPIDO	202	MSPISS1
203	MSPICLK	204	NC
205	+5VSUS	206	+5VSUS
207	NC	208	NC
209	NC	210	NC
211	+5V	212	+5V
213	+5V	214	+5V
215	+5V	216	+5V
217	+5V	218	+5V
219	+5V	220	+5V
221	+5V	222	+5V
223	+5V	224	+5V
225	+5V	226	+5V
227	+5V	228	+5V
229	+5V	230	+5V

Table 20: MXM connector pinout

4.2. DDR3 SODIMM Memory Slot

The mainboard has one 204-pin DDR3 SODIMM slot that supports non-ECC DDR3 1333 SODIMM memory module. The memory slot labeled as "SODIMM" can accommodate up to 8GB of DDR3 1333 memory. The location of the DDR3 SODIMM memory slot is shown below.

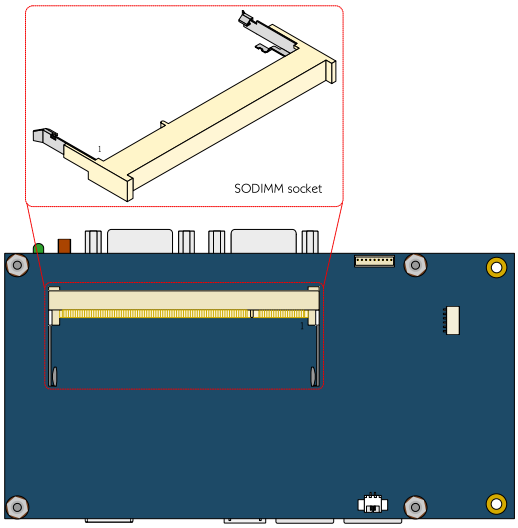

Figure 29: DDR3 SODIMM memory slot diagram

4.2.1. Installing a Memory Module

Step 1

Align the notch on the SODIMM memory module with the protruding wedge on the SODIMM memory slot. Insert the SODIMM memory module at a 30 degree angle relative to the SODIMM memory slot.

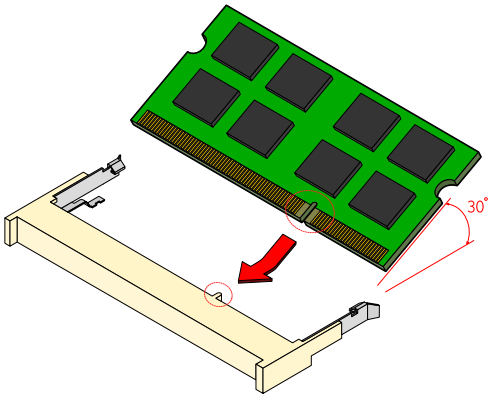

Figure 30: Inserting the memory module

Step 2

Push down the SODIMM memory module until the locking clips lock the module into place. There will be a slight tension as the SODIMM memory module is being locked.

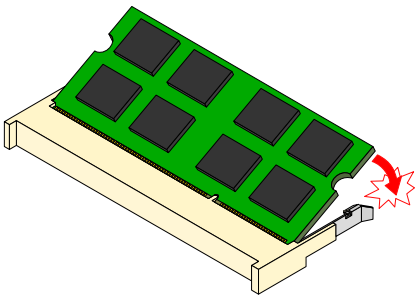

Figure 31: Locking the memory module

4.2.2. Removing a Memory Module

Step 1

To disengage the locking clips, push the locking clips horizontally outward away from the SODIMM memory module.

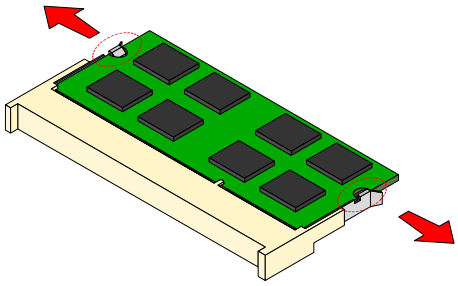

Figure 32: Disengaging the SODIMM locking clips

Step 2

When the locking clips have cleared, the SODIMM memory module will automatically pop up to the 30 degree angle. Remove the memory module.

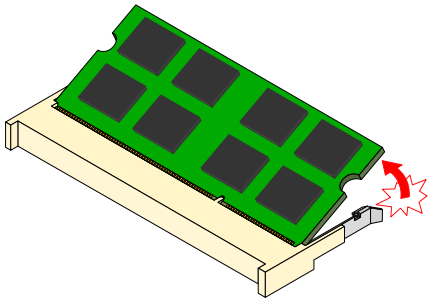

Figure 33: Removing the memory module

5. Hardware Installation

This chapter provides information about hardware installation procedures.

5.1. Installing the VNT9271 USB Wi-Fi Dongle

Step 1

Locate a USB 2.0 or USB 3.0 port on the panel I/O.

Step 2

Insert the VNT9271 USB Wi-Fi dongle into the USB 2.0 or USB 3.0 port.

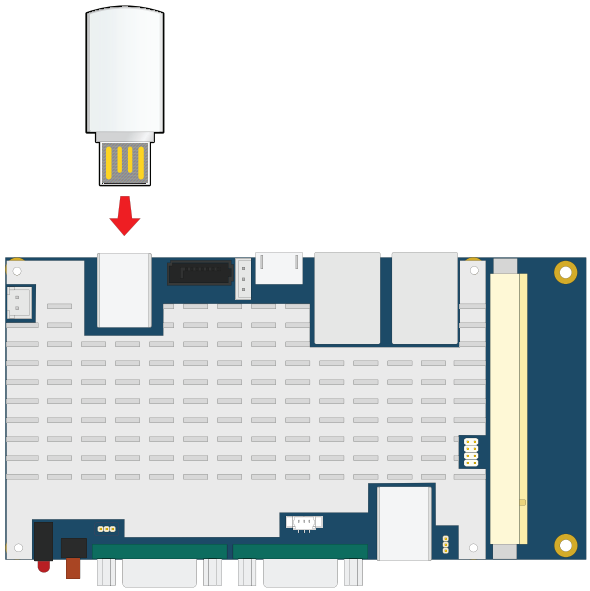

Figure 34: Inserting the VNT9271 USB Wi-Fi module

5.2. Installing the EMIO-1533 USB Wi-Fi Module

Step 1

Mount the EMIO-1533 to the prepared standoff in the chassis. Align the two mounting holes on the EMIO-1533 module with the mounting holes on the standoffs. And then secure the EMIO-1533 module in place with two screws.

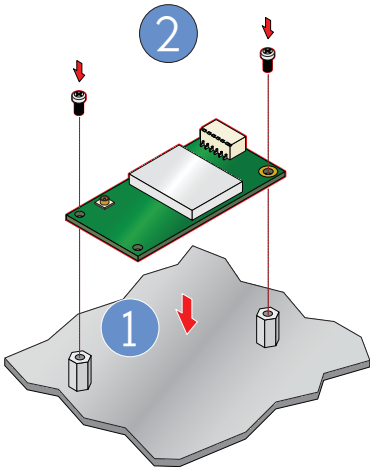

Figure 35: Installing EMIO-1533 USB Wi-Fi module

Step 2

Connect one end of the USB Wi-Fi cable to the onboard USB 2.0 connector (JWLAN), and then connect the other end of the cable to the EMIO-1533 module.

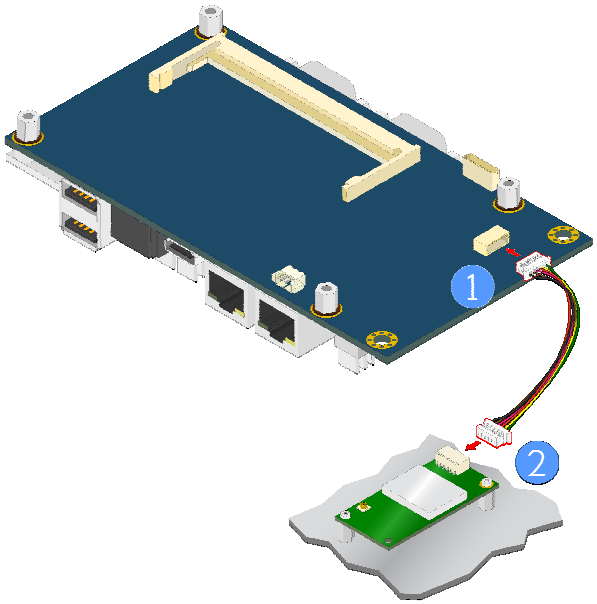

Figure 36: Connecting the USB Wi-Fi cable diagram

Step 3

Insert the Wi-Fi antenna cable into the antenna hole from the inside of the panel I/O plate. Insert the toothed washer, fasten it with the nut and install the external antenna.

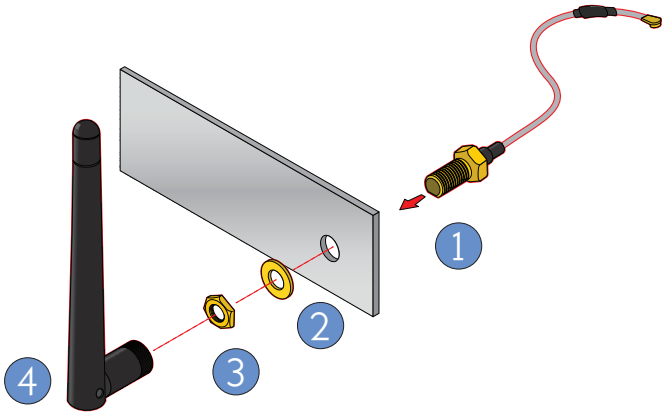

Figure 37: Installing Wi-Fi antenna cable diagram

Step 4

Connect the other end of the Wi-Fi antenna cable to the micro-RF connector labeled "IPEX" on the EMIO-1533 module.

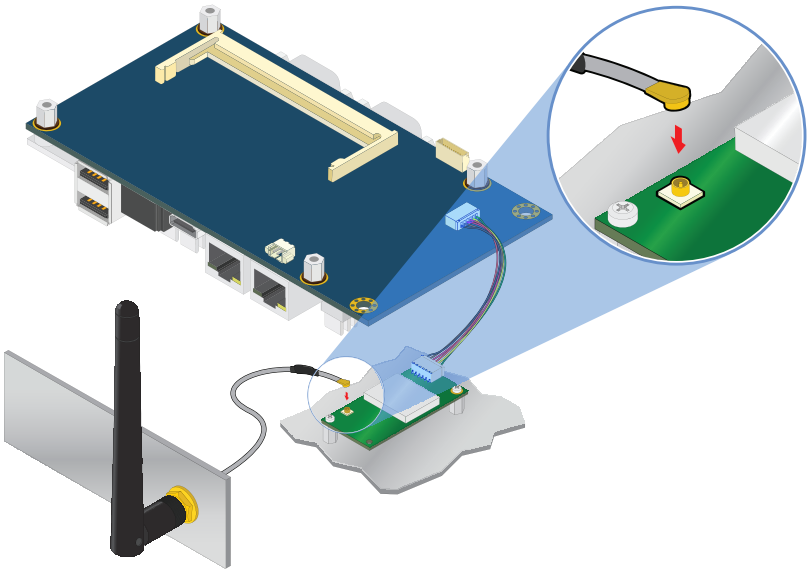

Figure 38: Connecting Wi-Fi antenna cable to the EMIO-1533 module

5.3. Installing the EMIO-5531 USB Wi-Fi + Bluetooth Module

Step 1

Mount the EMIO-5531 to the prepared standoff in the chassis. Align the two mounting holes on the EMIO-5531 module with the mounting holes on the standoffs. And then secure the EMIO-5531 module in place with two screws.

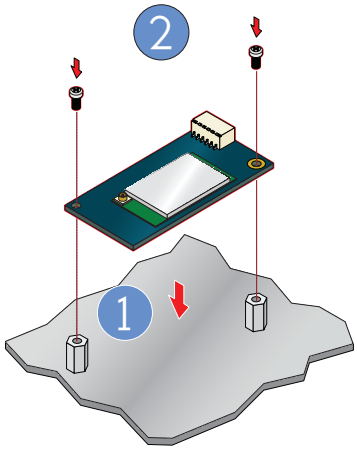

Figure 39: Installing EMIO-5531 USB Wi-Fi module

Step 2

Connect one end of the USB Wi-Fi cable to the onboard USB 2.0 connector (JWLAN), and then connect the other end of the cable to the EMIO-5531 module.

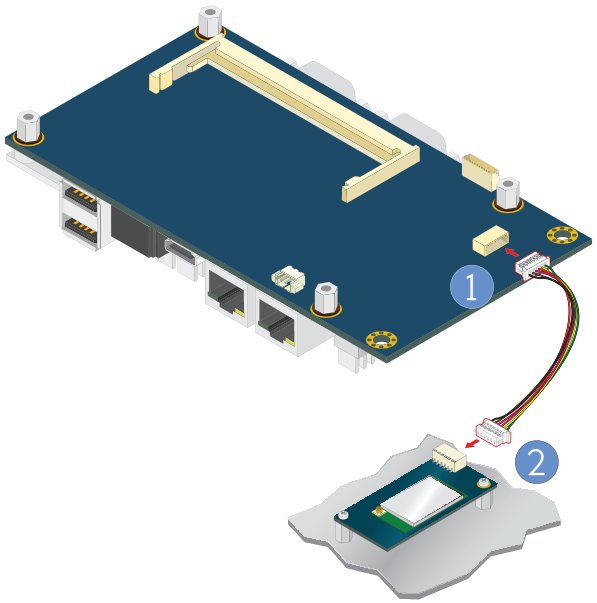

Figure 40: Connecting the USB Wi-Fi cable diagram

Step 3

Insert the Wi-Fi antenna cable into the antenna hole from the inside of the panel I/O plate. Insert the toothed washer, fasten it with the nut and install the external antenna.

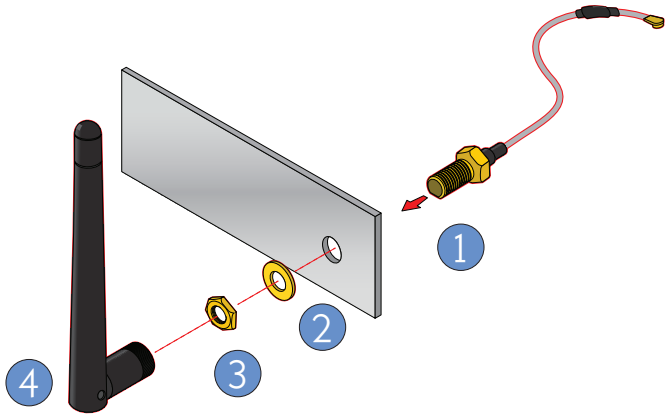

Figure 41: Installing Wi-Fi antenna cable diagram

Step 4

Connect the other end of the Wi-Fi antenna cable to the micro-RF connector labeled "IPEX" on the EMIO-5531 module.

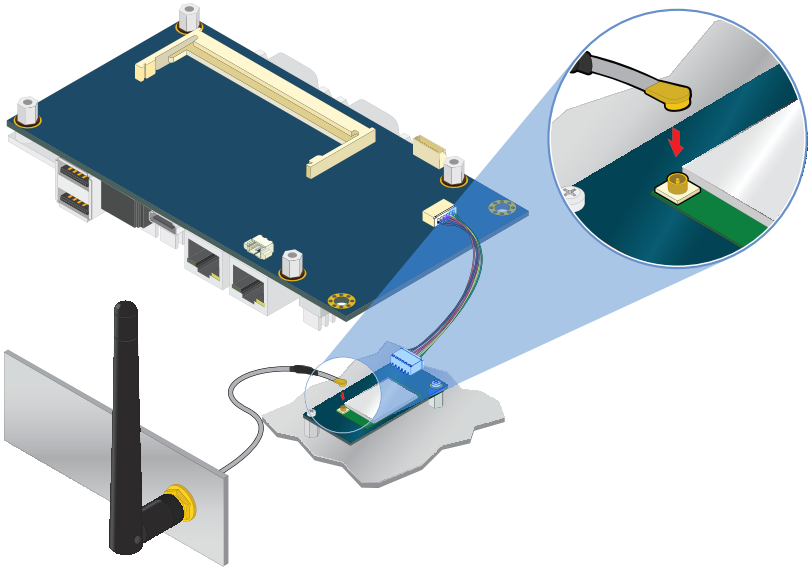

Figure 42: Connecting Wi-Fi antenna cable to the EMIO-5531 module

5.4. Installing into a Chassis

The EPIA-E900 can be fitted into any chassis that has the mounting holes compatible with the standard Pico-ITXe mounting hole locations. Additionally, the chassis must meet the minimum height requirements for specified areas of the mainboard.

5.4.1. Suggested minimum chassis dimensions

The figure below shows the suggested minimum space requirements that a chassis should have in order to work well with the EPIA-E900.

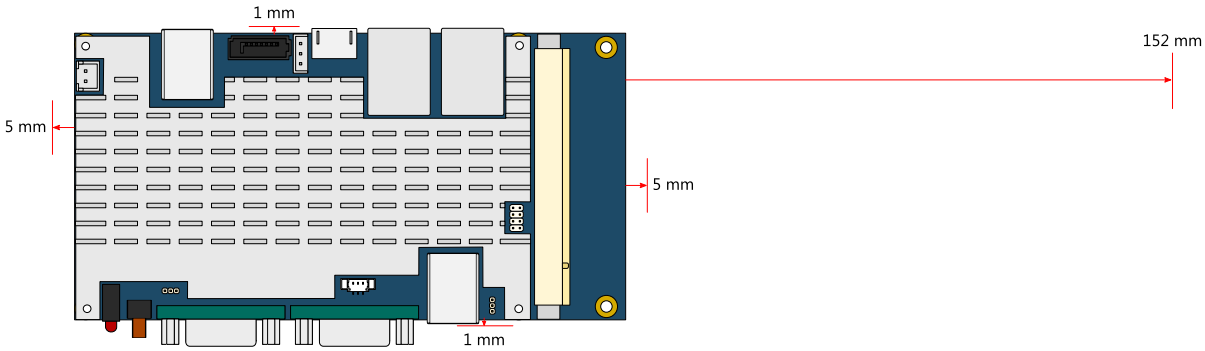

Figure 43: Suggested minimum chassis dimensions

Each side of the mainboard should have a buffer zone from the internal wall of the chassis. The two sides of the mainboard that accommodates the I/O coastline should have a buffer of 1.00mm. The two sides adjacent to the I/O coastline should have at least a 5.00mm buffer.

For the side that is close to the MXM connector, the buffer should be at least 152mm if the E900-A expansion card will be used.

Note:
The E900-A expansion card is for project based enquiries only. Please contact sales for detailed information.

5.4.2. Suggested minimum chassis height

The figure below shows the suggested minimum height requirements for the internal space of the chassis. It is not necessary for the internal ceiling to be evenly flat. What is required is that the internal ceiling height must be strictly observed for each section that is highlighted.

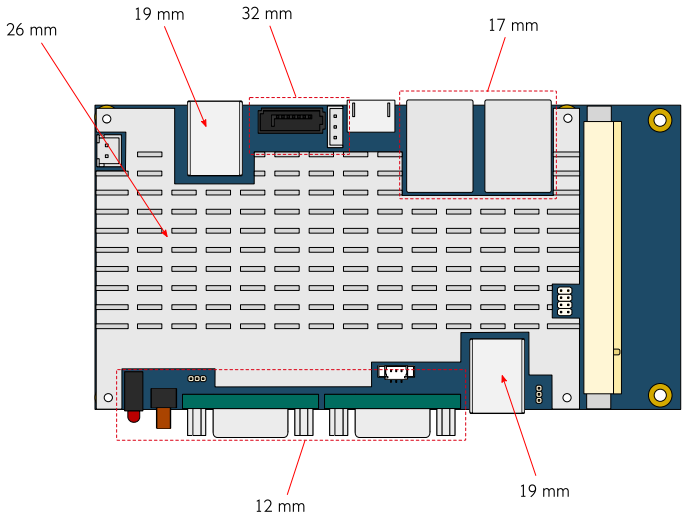

Figure 44: Suggested minimum internal chassis ceiling height

Note:

In getting the minimum height requirements for internal space of the chassis, it is required to consider the heights of the connectors (such as LPC connector, USB connector, CMOS battery connector and DDR3 SODIMM slot) on the bottom side of the EPIA-E900 board.

5.4.3. Suggested keepout areas

The figure below shows the areas of the mainboard that is highly suggested to leave unobstructed.

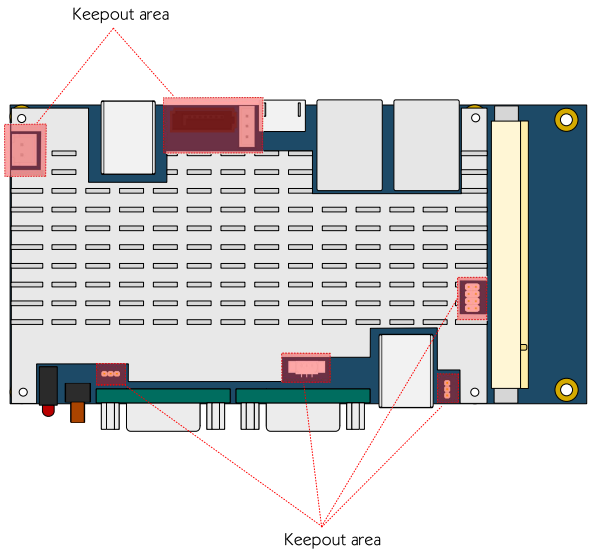

Figure 45: Suggested keepout areas (top side)

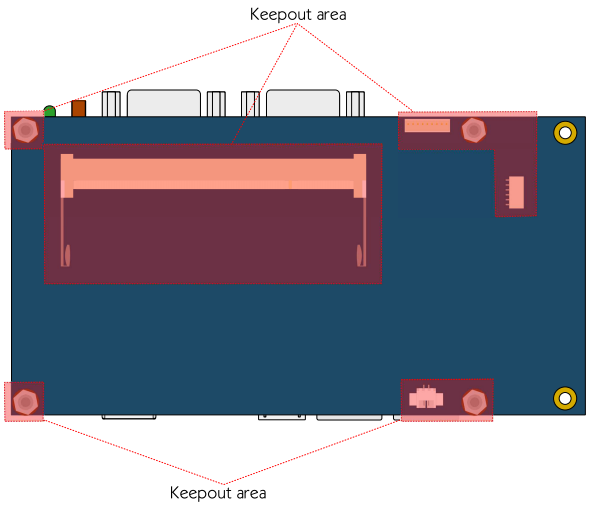

Figure 46: Suggested keepout areas (bottom side)

6. BIOS Setup Utility

6.1. Entering the BIOS Setup Utility

Power on the computer and press **Delete** during the beginning of the boot sequence to enter the BIOS Setup Utility. If the entry point has passed, restart the system and try again.

6.2. Control Keys

Up	Move up one row
Down	Move down one row
Left	Move to the left in the navigation bar
Right	Move to the right in the navigation bar
Enter	Access the highlighted item / Select the item
Esc	Jumps to the Exit screen or returns to the previous screen
+[1]	Increase the numeric value
-[1]	Decrease the numeric value
F1	General help[2]
F2	Previous value
F3	Load optimized defaults
F4	Save all the changes and exit

Notes:
Must be pressed using the 10-key pad.
The General help contents are only for the Status Page and Option Page setup menus.

6.3. Getting Help

The BIOS Setup Utility provides a "**General Help**" screen. This screen can be accessed at any time by pressing **F1**. The help screen displays the keys for using and navigating the BIOS Setup Utility. Press **Esc** to exit the help screen.

6.4. System Overview

The System Overview screen is the default screen that is shown when the BIOS Setup Utility is launched. This screen can be accessed by traversing the navigation bar to the "Main" label.

Figure 47: Illustration of the Main menu screen

6.4.1. BIOS Information

The content in this section of the screen shows the information about the vendor, the Core version, UEFI specification version, the project version and date & time of the project build.

6.4.2. Memory Information

This section shows the amount of memory that is installed on the hardware platform.

6.4.3. System Language

This option allows the user to configure the language that the user wants to use.

6.4.4. System Date

This section shows the current system date. Press **Tab** to traverse right and **Shift+Tab** to traverse left through the month, day, and year segments. The **+** and **-** keys on the number pad can be used to change the values. The weekday name is automatically updated when the date is altered. The date format is [Weekday, Month, Day, Year].

6.4.5. System Time

This section shows the current system time. Press **Tab** to traverse right and **Shift+Tab** to traverse left through the hour, minute, and second segments. The **+** and **-** keys on the number pad can be used to change the values. The time format is [Hour : Minute : Second].

6.5. Advanced Settings

The Advanced Settings screen shows a list of categories that can provide access to a sub-screen. Sub-screen links can be identified by the preceding right-facing arrowhead.

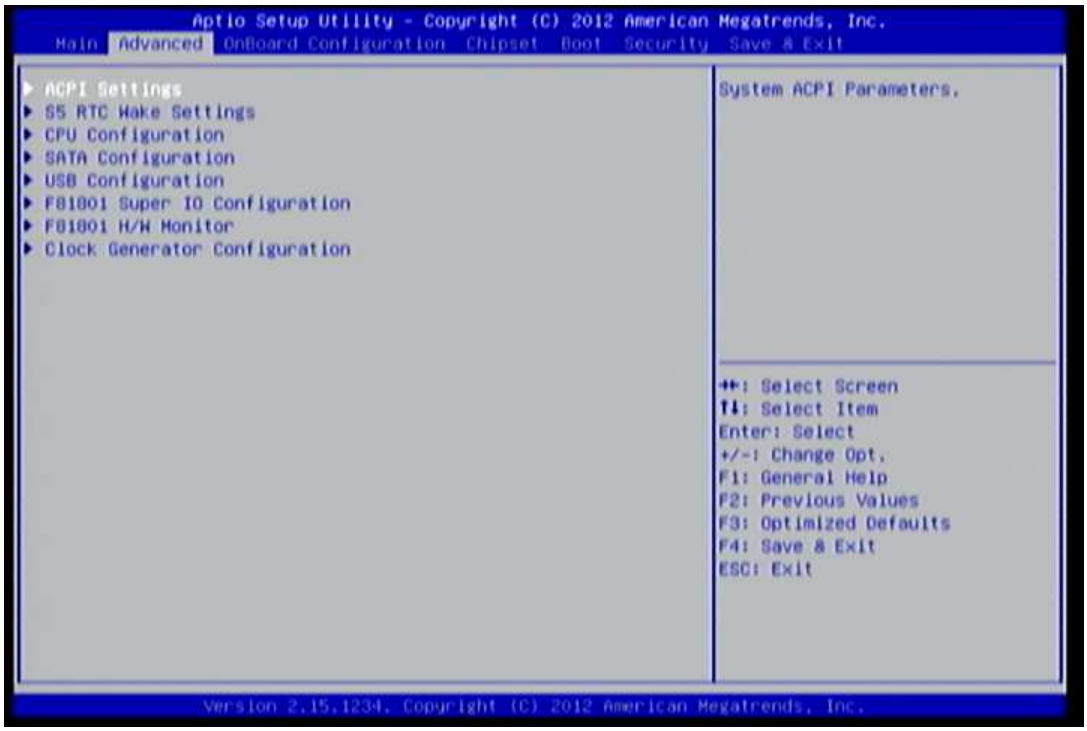

Figure 48: Illustration of the Advanced Settings screen

The Advanced Settings screen contains the following links:

- ACPI Settings
- S5 RTC Wake Settings
- CPU Configuration
- SATA Configuration
- USB Configuration
- F81801 Super IO Configuration
- F81801 H/W Monitor
- Clock Generator Configuration

6.5.1. ACPI Settings

ACPI grants the operating system direct control over system power management. The ACPI Configuration screen can be used to set a number of power management related functions.

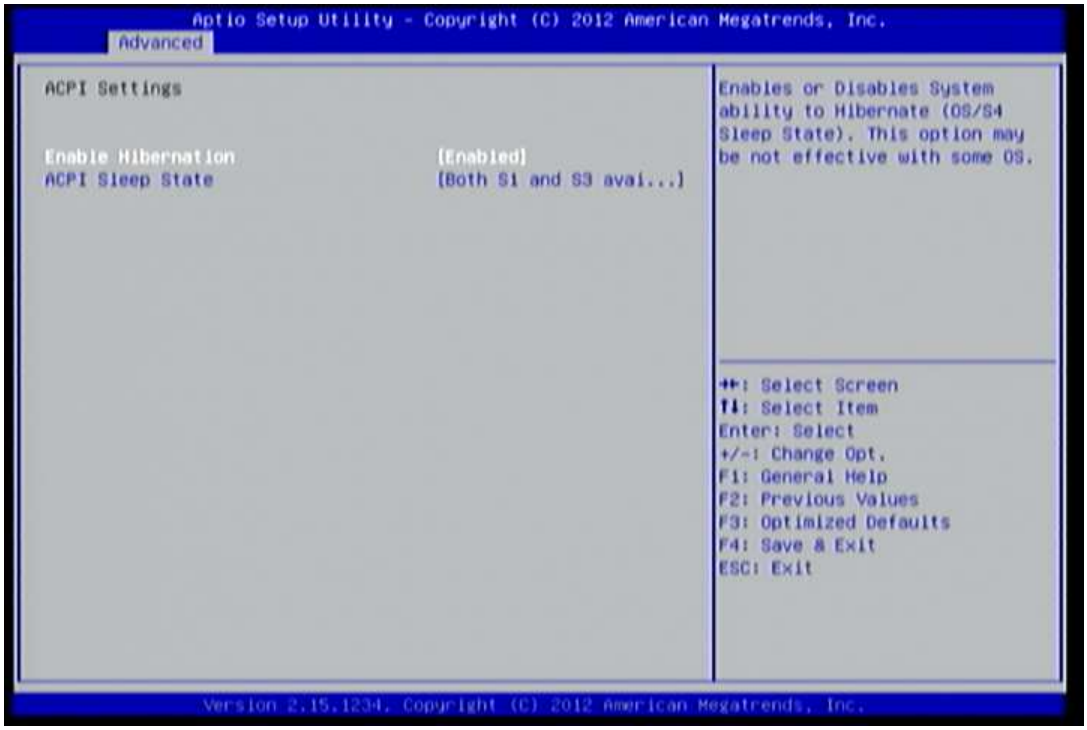

Figure 49: Illustration of the ACPI Settings screen

6.5.1.1. Enable Hibernation

Enable/disable system ability to Hibernate.

6.5.1.2. ACPI Sleep State

Select the highest ACPI sleep state the system will enter when the SUSPEND button is selected. Available options are: Suspend Disabled / S1(CPU Stop Clock) /S3 (Suspend to RAM) / Both S1 and S3 available for OS to choose.

6.5.2. S5 RTC Wake Settings

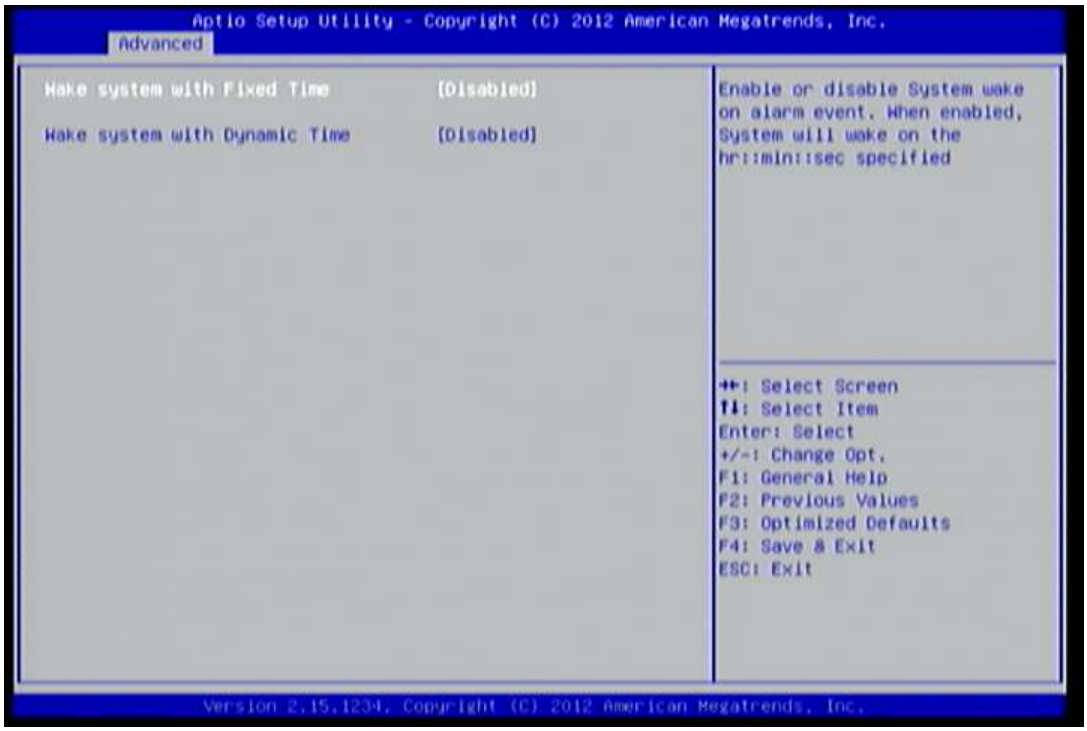

Figure 50: Illustration of the S5 RTC Wake Settings screen

6.5.2.1. Wake system with Fixed Time

Enable or disable system wake on alarm event. When enabled, system will wake on the hr:min:sec specified.

6.5.2.2. Wake system with Dynamic Time

Enable or disable Wake system with Dynamic Time.

6.5.3. CPU Configuration

The CPU Configuration screen shows detailed information about the built-in processor. In addition to the processor information, the thermal controls can be set.

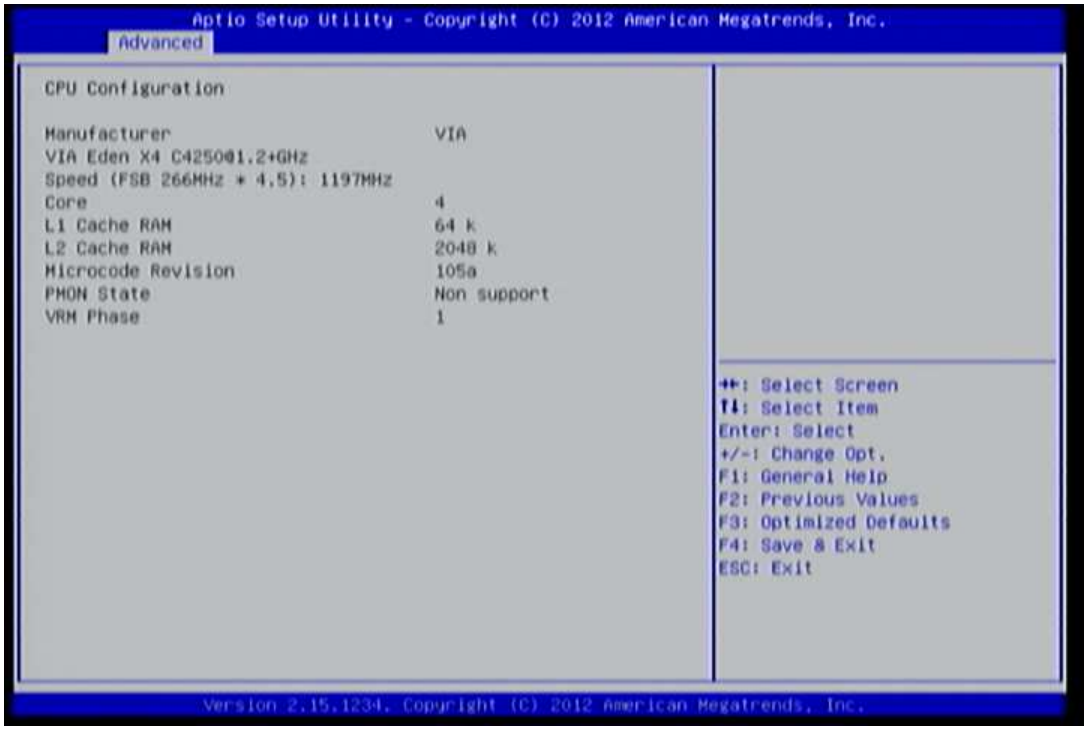

Figure 51: Illustration of CPU Configuration screen

6.5.4. SATA Configuration

The SATA Configuration screen allows the user to view and configure the settings of the SATA configuration settings.

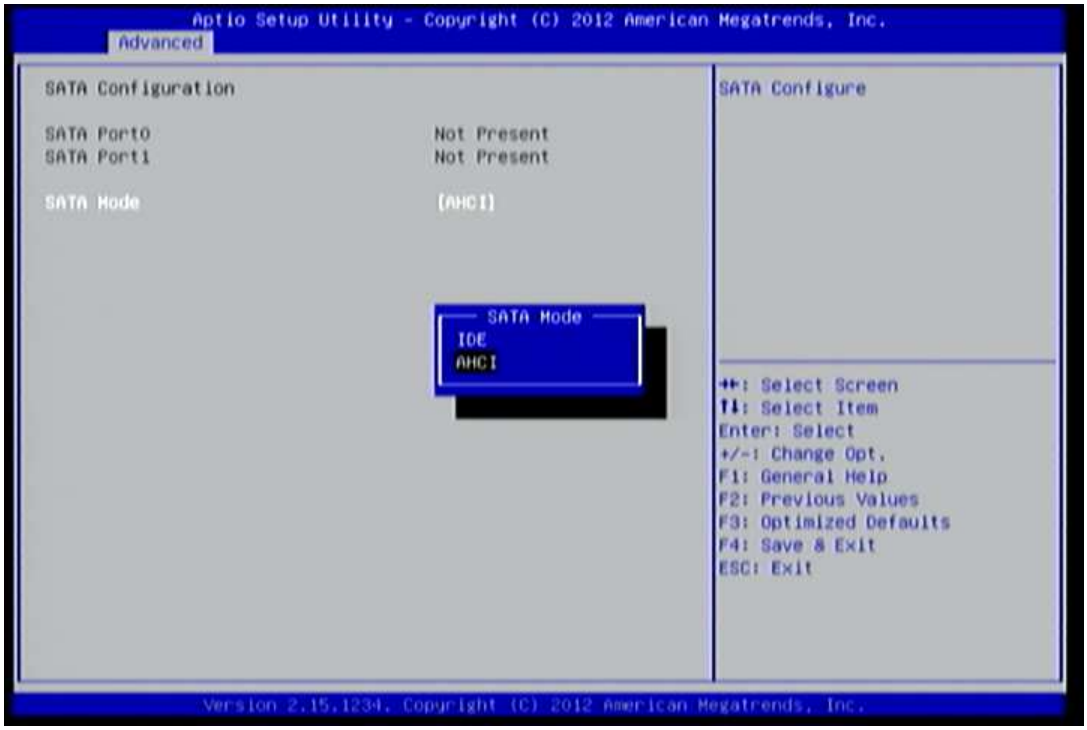

Figure 52: Illustration of SATA Configuration screen

6.5.4.1. SATA Mode

This option allows the user to manually configure SATA controller for a particular mode.

IDE Mode
Set this value to change the SATA to IDE mode.

AHCI Mode
Set this value to change the SATA to AHCI mode.

6.5.5. USB Configuration

The USB Configuration screen shows the number of connected USB devices.

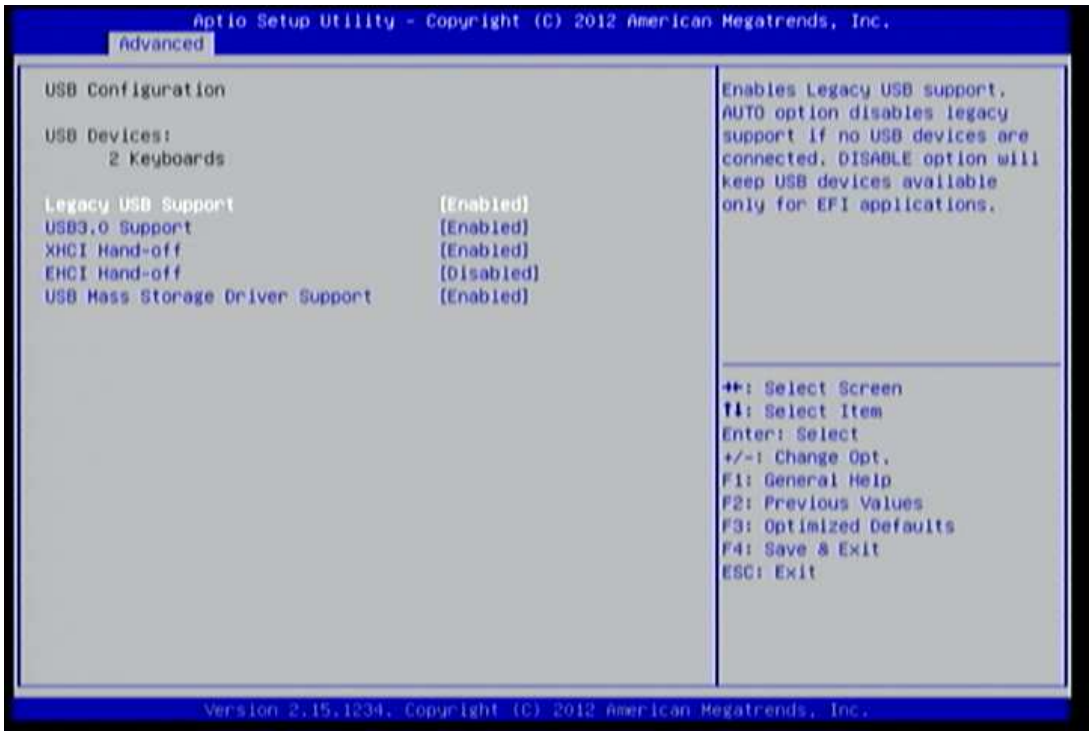

Figure 53: Illustration of PC Health Status screen

6.5.5.1. Legacy USB Support

The Legacy USB Support feature enables environments that do not have native USB support to use USB devices. This feature has three options.

Enabled

The Enabled option keeps the Legacy USB Support feature on at all times.

Disabled

The Disabled option keeps the Legacy USB Support feature off at all times.

Auto

The system automatically disables legacy support if no USB Devices are connected.

6.5.5.2. USB3.0 Support

Enable/Disable USB3.0 (XHCI) Controller support.

6.5.5.3. XHCI Hand-off

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

6.5.5.4. EHCI Hand-off

This is a workaround feature for Operating Systems without EHCI hand-off support. The EHCI ownership change must be claimed by EHCI Driver.

Enabled
This option enables EHCI hand-off support.

Disabled
This option disables EHCI hand-off support.

6.5.5.5. USB Mass Storage Driver Support

Enable/Disable USB Mass Storage Driver Support

6.5.6. F81801 Super IO Configuration

The F81801 Super IO Configuration screen allows the user to set system Super IO Chip parameters

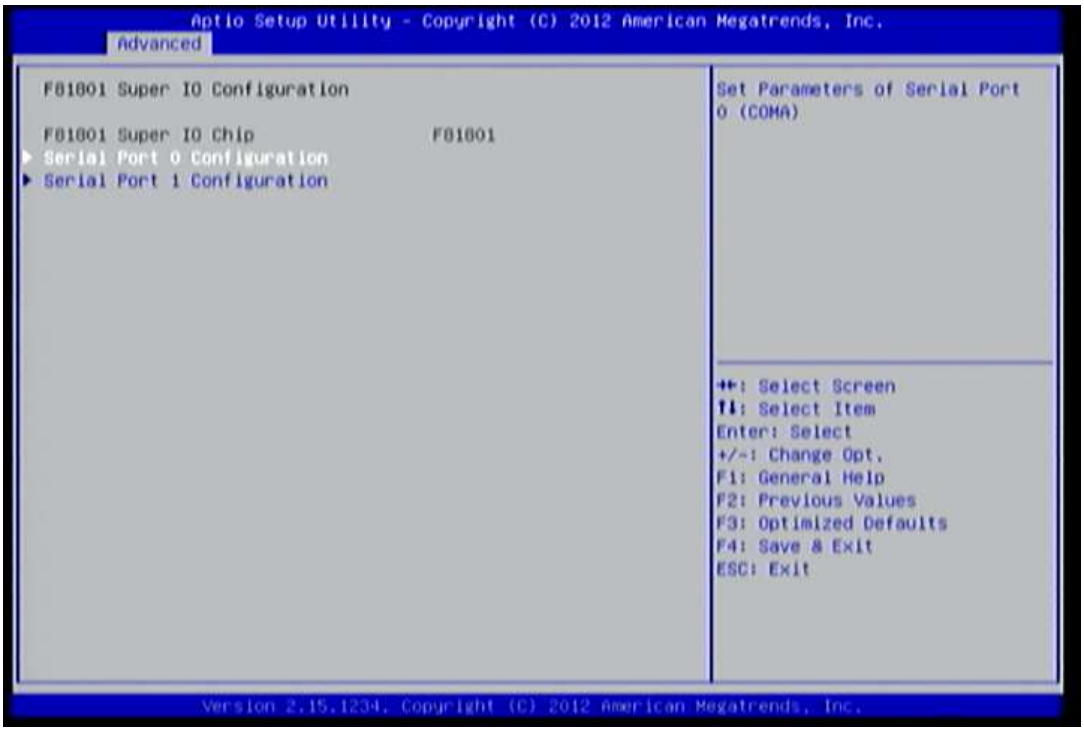

Figure 54: Illustration of F81801 Super IO Configuration screen

6.5.6.1. Serial Port 0 Configuration

Set parameters of Serial Port 0 (COMA).

6.5.6.1.1. Change setting

Select an optimal setting for Super IO device.

6.5.6.2. Serial Port 1 Configuration

Set parameters of Serial Port 1 (COMB).

6.5.6.2.1. Uart Transmission Mode

Select an optimal setting for Super IO device.

6.5.7. F81801 H/W Monitor

F81801 screen shows F81801 H/W Monitor status.

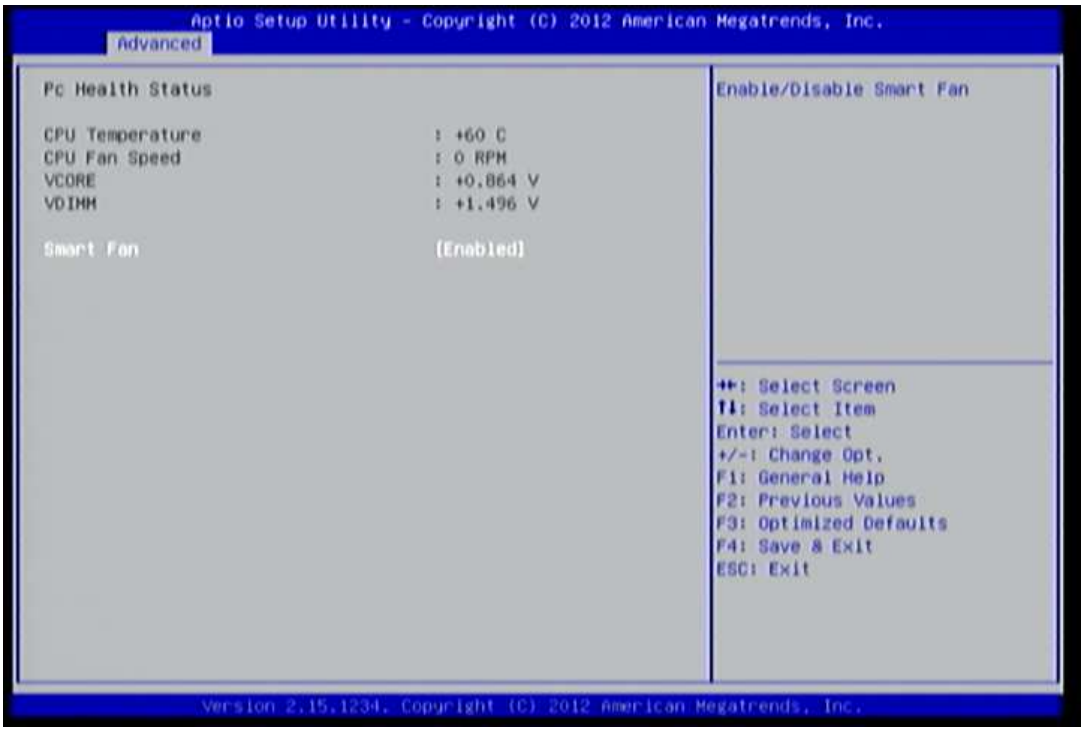

Figure 55: Illustration of F81801 H/W Monitor

6.5.7.1. Smart Fan

This feature has 2 options: Enable or Disable Smart Fan.

6.5.8. Clock Generator Configuration

The Clock Generator Configuration screen enables access to the Spread Spectrum Setting feature.

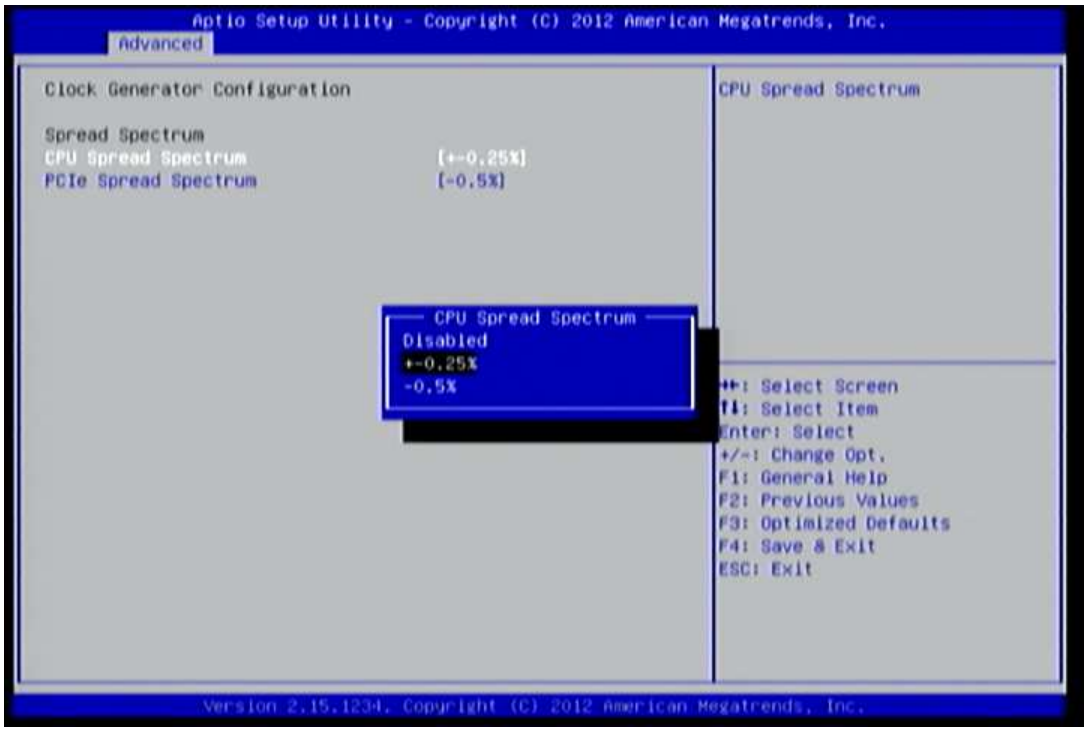

Figure 56: Illustration of Clock Generator Configuration screen

6.5.8.1. CPU Spread Spectrum

The Spread Spectrum Setting feature enables the BIOS to modulate the clock frequencies originating from the mainboard. The settings are in percentages of modulation. Higher percentages result in greater modulation of clock frequencies. This feature has 3 options: Disable, +-0.25% and -0.5%.

6.5.8.2. PCIe Spread Spectrum

Select PCIe Spread Spectrum. This feature has 2 options: Disable and -0.5%.

6.6. OnBoard Device Configuration

The OnBoard Device Configuration screen has the following features.

Figure 57: Illustration of OnBoard Device Configuration screen

6.6.1. S5 Wakeup by PME#

The S5 Wakeup by PME# feature enables the BIOS to allow remote wake-up from the S5 power off state through the PCI bus.

6.7. Chipset Settings

The Chipset Settings screen shows a list of categories that can provide access to a sub-screen. Sub-screen links can be identified by the preceding right-facing arrowhead.

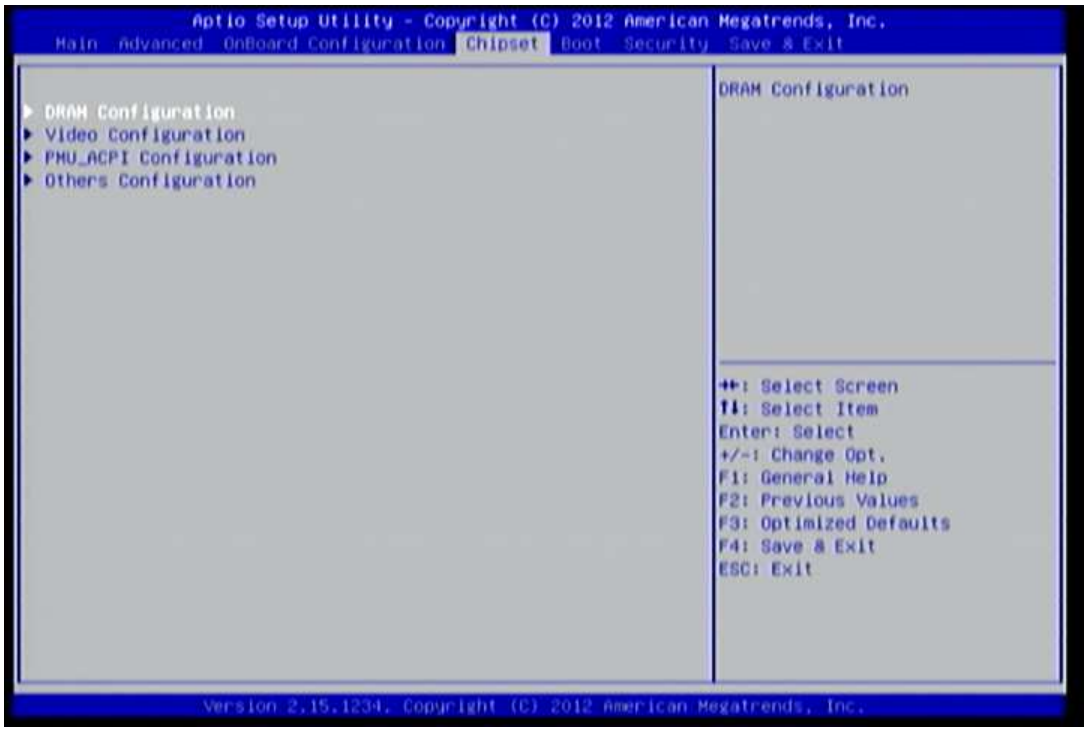

Figure 58: Illustration of Chipset Settings screen

The Chipset Settings screen contains the following links:

- DRAM Configuration
- Video Configuration
- PMU-ACPI Configuration
- Others Configuration

6.7.1. DRAM Configuration

The DRAM Configuration screen has two features for controlling the system DRAM. All other DRAM features are automated and cannot be accessed.

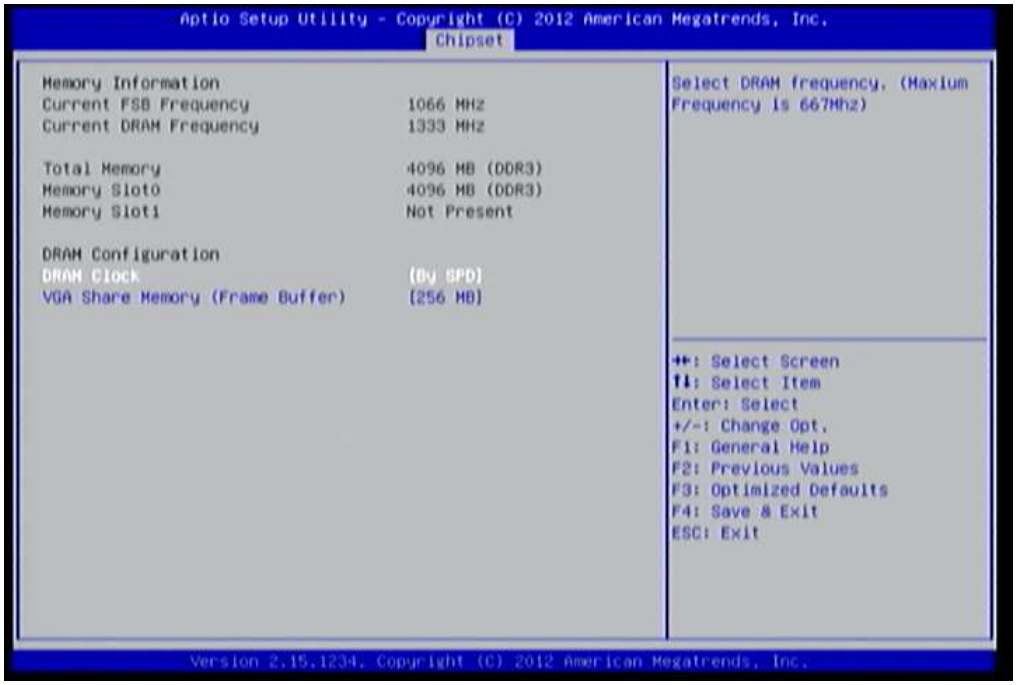

Figure 59: Illustration of DRAM Configuration screen

6.7.1.1. DRAM Clock

The DRAM Clock option enables the user to determine how the BIOS handle the memory clock frequency. The memory clock can either be dynamic or static. This feature has eleven options.

By SPD
By SPD option enables the BIOS to select a compatible clock frequency for the installed memory.

400 MHz
The 400 MHz option forces the BIOS to be fixed at 800 MHz for DDR3 memory modules.

533 MHz
The 533 MHz option forces the BIOS to be fixed at 1066 MHz for DDR3 memory modules.

566 MHz
The 566 MHz option forces the BIOS to be fixed at 1132 MHz for DDR3 memory modules.

600 MHz
The 600 MHz option forces the BIOS to be fixed at 1200 MHz for DDR3 memory modules.

633 MHz
The 633 MHz option forces the BIOS to be fixed at 1266 MHz for DDR3 memory modules.

667 MHz
The 667 MHz option forces the BIOS to be fixed at 1334 MHz for DDR3 memory modules.

6.7.1.2. VGA Share Memory (Frame Buffer)

The VGA Share Memory feature enables the user to choose the amount of the system memory to reserve for use by the integrated graphics controller. The selections of memory amount that can be reserved are 256MB and 512MB.

6.7.2. Video Configuration

The Video Configuration screen has features for controlling the integrated graphics controller in the VX11H chipset.

Figure 60: Illustration of Video Configuration screen

6.7.2.1. Dual VGA Enable

This feature has two options: Enable/Disable Dual VGA.

6.7.2.2. Primary Graphics Adapter

The Primary Graphics Adapter option enables the user to change the order in which the BIOS seeks for a graphics adapter. There are three paths that can be chosen.

PCIE & PCI -> UMA

UMA -> PCIE & PCI

6.7.2.3. HD Audio #1

This feature has 2 options: Enable/Disable HD Audio #1.

6.7.3. PMU_ACPI Configuration

The PMU_ACPI Configuration screen can be used to set a number of power management related functions.

Figure 61: Illustration of PMU_ACPI Configuration screen

6.7.3.1. Other Control

Figure 62: Illustration of Other Control screen

6.7.3.1.1. AC Loss Auto-restart

AC Loss Auto-restart defines how the system will respond after AC power has been interrupted while the system is on. There are three options.

Power Off
The Power Off option keeps the system in an off state until the power button is pressed again.

Power On
The Power On option restarts the system when the power has returned.

Last State
The Last State option restores the system to its previous state when the power was interrupted.

6.7.3.1.2. USB S4 WakeUp

The USB S4 WakeUp enables the system to resume through the USB device port from S4 state. There are two options: "Enabled" or "Disabled".

6.7.4. Others Configuration

The Others Configuration screen can be used to set Watchdog Timer Configuration and Keyboard/Mouse Wakeup Configuration.

Figure 63: Illustration of Others Configuration screen

6.7.4.1. WATCHDOG Timer Enable

The WATCHDOG Timer Enable feature unlocks three other features that enable the BIOS to monitor the state of the system. This feature has two options: enabled or disabled.

6.7.4.2. WATCHDOG Timer RUN/STOP

The WATCHDOG Timer RUN/STOP feature controls if the WATCHDOG timer is active or dormant. This feature has two options: stop and run.

6.7.4.3. WATCHDOG Timer ACTION

The WATCHDOG Timer ACTION feature determines the action the WATCHDOG timer should take if the timer counts down to zero. This feature has two options: reset and power off.

6.7.4.4. WATCHDOG Timer COUNT

The WATCHDOG Timer COUNT feature determines the length of time the timer should count when the timer is first triggered. This feature has four options: 72, 389, 706, and 1023 seconds.

6.8. Boot Settings

The Boot Settings screen has a single link that goes to the **Boot Configuration** and **Boot Option Priorities** screens.

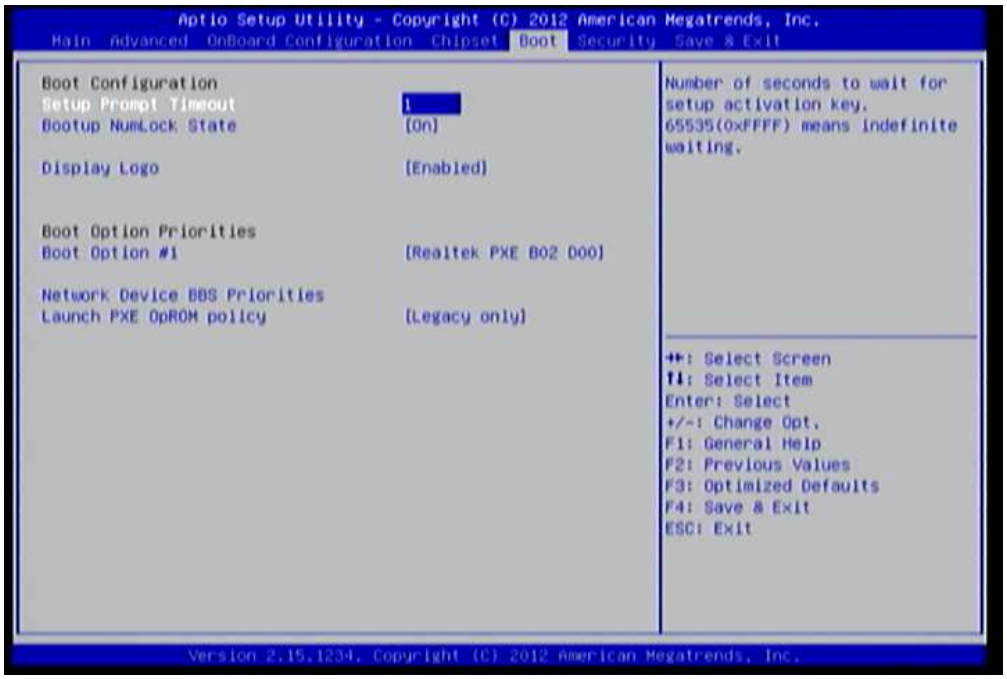

Figure 64: Illustration of Boot Settings screen

6.8.1. Boot Configuration

The Boot Settings Configuration screen has several features that can be run during the system boot sequence.

6.8.1.1. Setup Prompt Timeout

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

6.8.1.2. BootupNumLock State

Select the keyboard NumLock state from On and Off.

6.8.1.3. Display Logo

The Display Logo feature hides all of the Power-on Self Test (POST) messages during the boot sequence. Instead of the POST messages, the user will see an OEM logo. This feature has two options: enabled and disabled.

6.8.2. Boot Option Priorities

The Boot Option Priorities screen lists all bootable devices.

6.8.2.1. Launch PXE OpROM policy

Do not launch
Prevent the option for Legacy Network Device.

Legacy only
Allow the option for Legacy Network Device.

6.9. Security

The Security Settings screen provides a way to restrict access to the BIOS or even the entire system.

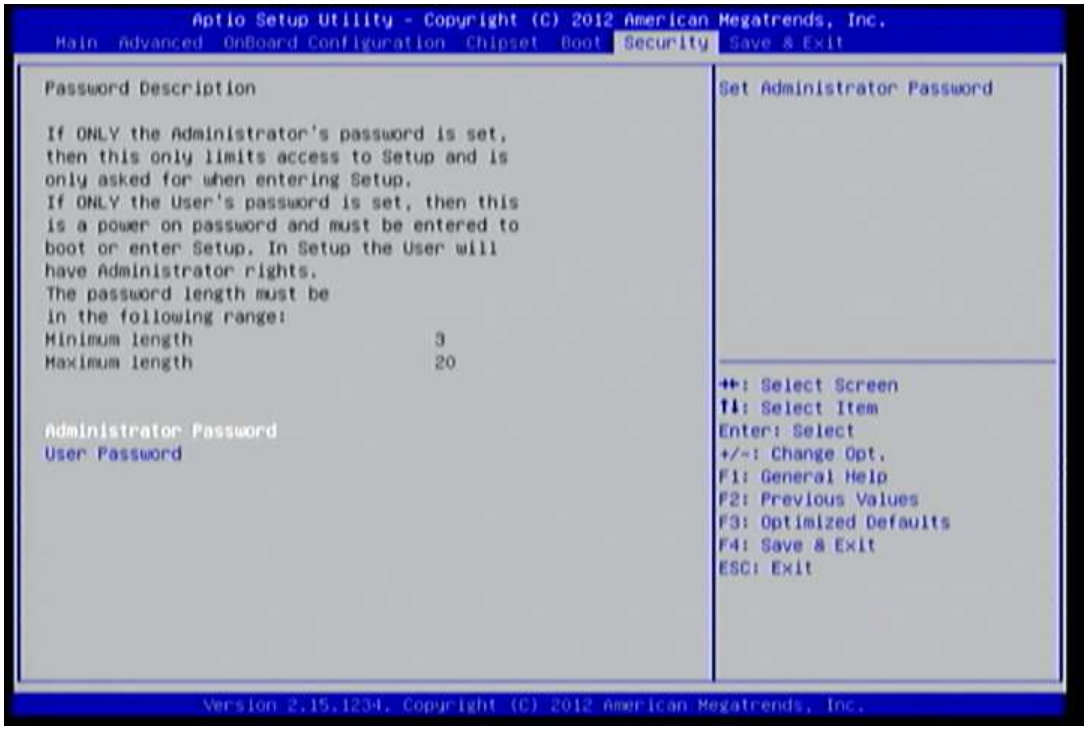

Figure 65: Illustration of Security Settings screen

6.9.1. Security Settings

6.9.1.1. Administrator Password / User Password

This option is for setting a password for accessing the BIOS setup utility. When a password has been set, a password prompt will be displayed whenever the BIOS setup utility is launched. This prevents an unauthorized person from changing any part of the system configuration.

When a supervisor password is set, the **Password Check** option will be unlocked.

6.10. Save & Exit

The Save & Exit Configuration screen has the following features:

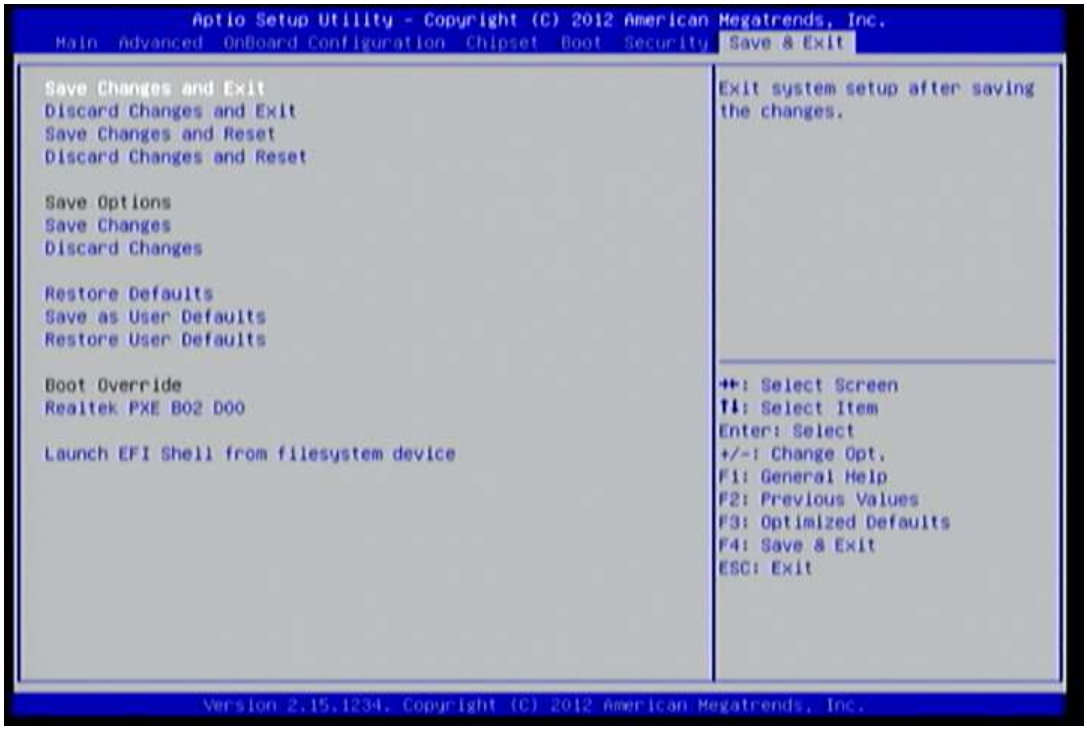

Figure 66: Illustration of Save & Exit screen

6.10.1. Save Changes and Exit

Save all changes to the BIOS and exit the BIOS Setup Utility. The "F4" hotkey can also be used to trigger this command.

6.10.2. Discard Changes and Exit

Exit the BIOS Setup Utility without saving any changes. The "Esc" hotkey can also be used to trigger this command.

6.10.3. Save Changes and Reset

Save all changes to the BIOS and reboot the system. The new system configuration parameters will take effect.

6.10.4. Discard Changes and Reset

This command reverts all changes to the settings that were in place when the BIOS Setup Utility was launched.

Save Options

6.10.5. Save Changes

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

6.10.6. Discard Changes

This command reverts all changes to the settings that were in place when the BIOS Setup Utility was launched.

Restore Defaults

6.10.7. Save as User Defaults

Save the changes done so far as User Defaults.

6.10.8. Restore User Defaults

Restore the User Defaults to all the setup options.

Boot Override

Launch EFI Shell from filesystem device

7. Software and Technical Supports

7.1. Microsoft and Linux Support

The VIA EPIA-E900 is highly compatible with Microsoft Windows and Linux operating systems.

7.1.1. Driver Installation

Microsoft Driver Support

The latest Windows drivers can be downloaded from the VIA website at www.viatech.com

Linux Driver Support

Linux drivers are provided through various methods including:

- Drivers provided by VIA (binary only). An ARCM or NDA/BSLA may be asked in order to get the drivers, please contact our sales representative to submit a request.
- Using a driver built into a distribution package.
- Visiting www.viatech.com for the latest updated drivers.
- Installing a third party driver (such as the ALSA driver from the Advanced Linux Sound Architecture project for integrated audio).

7.2. Technical Supports and Assistance

- For utilities downloads, latest documentation and new information about the EPIA-E900, go to http://www.viatech.com/en/boards/pico-itx/epia-e900/
- For technical support and additional assistance, always contact your local sales representative or board distributor, or go to www.viatech.com/en/about/contact/ to fill up the form request.
- For OEM clients and system integrators developing a product for long term production, other code and resources may also be made available. Contact VIA to submit a request.

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