



**MODEL:
eKINO-BT**

Mini-ITX SBC Supports AUPS Sub-System, 22nm Intel® Atom™ or Celeron® SoC, 9 V ~ 26 V DC-IN, VGA, Dual LVDS, Dual GbE, USB 3.2 Gen 1, PCIe Mini, CFast, HD Audio and RoHS

User Manual

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Revision

Date	Version	Changes
May 27, 2021	1.07	Updated Section 2.3: Packing List Updated Chapter 6: Software Drivers
June 29, 2017	1.06	Updated BIOS spec on page 8
January 23, 2017	1.05	Changed part number of the optional PS/2 keyboard and mouse Y cable (page 14)
February 16, 2016	1.04	Added notes below Figure 3-1 and Figure 3-2
December 14, 2015	1.03	Added a note in Section 3.3.6: VGA Connector
February 13, 2015	1.02	Changed power input voltage range to 9 V ~ 26 V
January 23, 2015	1.01	Updated part number of the SATA cable
September 24, 2014	1.00	Initial release

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Manual Conventions



WARNING

Warnings appear where overlooked details may cause damage to the equipment or result in personal injury. Warnings should be taken seriously.



CAUTION

Cautionary messages should be heeded to help reduce the chance of losing data or damaging the product.



NOTE

These messages inform the reader of essential but non-critical information. These messages should be read carefully as any directions or instructions contained therein can help avoid making mistakes.

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Chapter

1

Introduction

1.1 Introduction

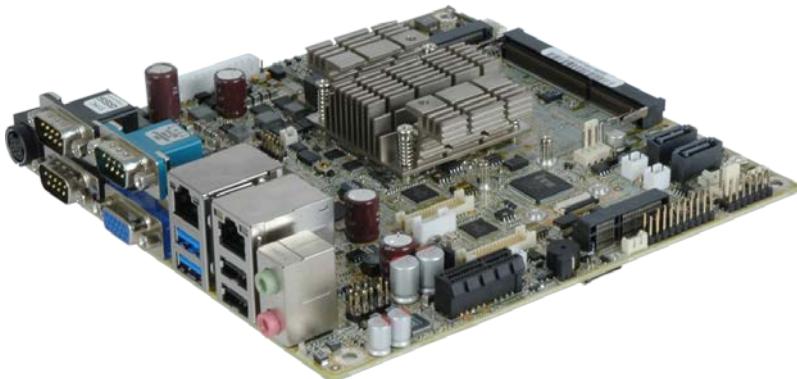


Figure 1-1: eKINO-BT

The eKINO-BT is a Mini-ITX SBC that supports AUPS sub-system. It has an on-board 22nm Intel® Atom™ or Celeron® SoC, and supports one or two 204-pin 1333/1066 MHz unbuffered DDR3L SDRAM SO-DIMMs.

The eKINO-BT provides two GbE interfaces through the Realtek RTL8111E PCIe GbE controllers. In addition, the eKINO-BT comes with one VGA and two 18-bit/24-bit dual-channel LVDS connectors for dual independent display.

Expansion and I/O include two USB 3.2 Gen 1 (5Gb/s) and two USB 2.0 on the rear panel, two USB 2.0 by pin header, two SATA 3Gb/s, four RS-232, one RS-422/485, one CFast card slot, one PCIe Mini card slot and one PCIe x1 slot. High Definition Audio (HDA) support ensures HDA devices can be easily implemented on the eKINO-BT.

1.2 Model Variations

The model variations for the eKINO-BT series are listed in **Table 1-1**.

Model	On-board SoC				
	Name	Clock Speed	# of Cores	L2 Cache	Max TDP
EKINO-BT-J19001	Intel® Celeron® J1900	2.0 GHz	4	2 MB	10 W
EKINO-BT-N29301	Intel® Celeron® N2930	1.83 GHz	4	2 MB	7.5 W
EKINO-BT-N28071	Intel® Celeron® N2807	1.58 GHz	2	2 MB	4.3 W
EKINO-BT-E38451	Intel® Atom™ E3845	1.91 GHz	4	2 MB	10 W
EKINO-BT-E38271	Intel® Atom™ E3827	1.75 GHz	2	1 MB	8 W
EKINO-BT-E38261	Intel® Atom™ E3826	1.46 GHz	2	1 MB	7 W
EKINO-BT-E38251	Intel® Atom™ E3825	1.33 GHz	2	1 MB	6 W
EKINO-BT-E38151	Intel® Atom™ E3815	1.46 GHz	1	512 KB	5 W

Table 1-1: Model Variations

1.3 Features

Some of the eKINO-BT motherboard features are listed below:

- Mini-ITX form factor
- On-board 22nm Intel® Atom™ or Celeron® SoC
- Supports AUPS sub-system, acts as a simple UPS system
- Wide-range 9 V ~ 26 V DC input design
- Two 204-pin 1333/1066 MHz dual-channel unbuffered DDR3L SDRAM SO-DIMM slots support up to 8 GB (for J1900, N2930, E3845, E3827 and E3826 SKUs)
- **or**
- One 204-pin 1333/1066 MHz unbuffered DDR3L SDRAM SO-DIMM slot supports up to 4 GB (for N2807, E3825 and E3815 SKUs)
- Dual independent display via VGA and dual LVDS interfaces
- Complete I/O interfaces, including two USB 3.2 Gen 1 (5Gb/s), four USB 2.0, four RS-232, one RS-422/485 and two SATA 3Gb/s
- Flexible expansion options, including one PCIe Mini card slot, one CFast card slot, one microSD card slot (E38XX SKU only) and one PCIe x1 slot
- RoHS compliant

1.4 Connectors

The connectors on the eKINO-BT are shown in the figures below.

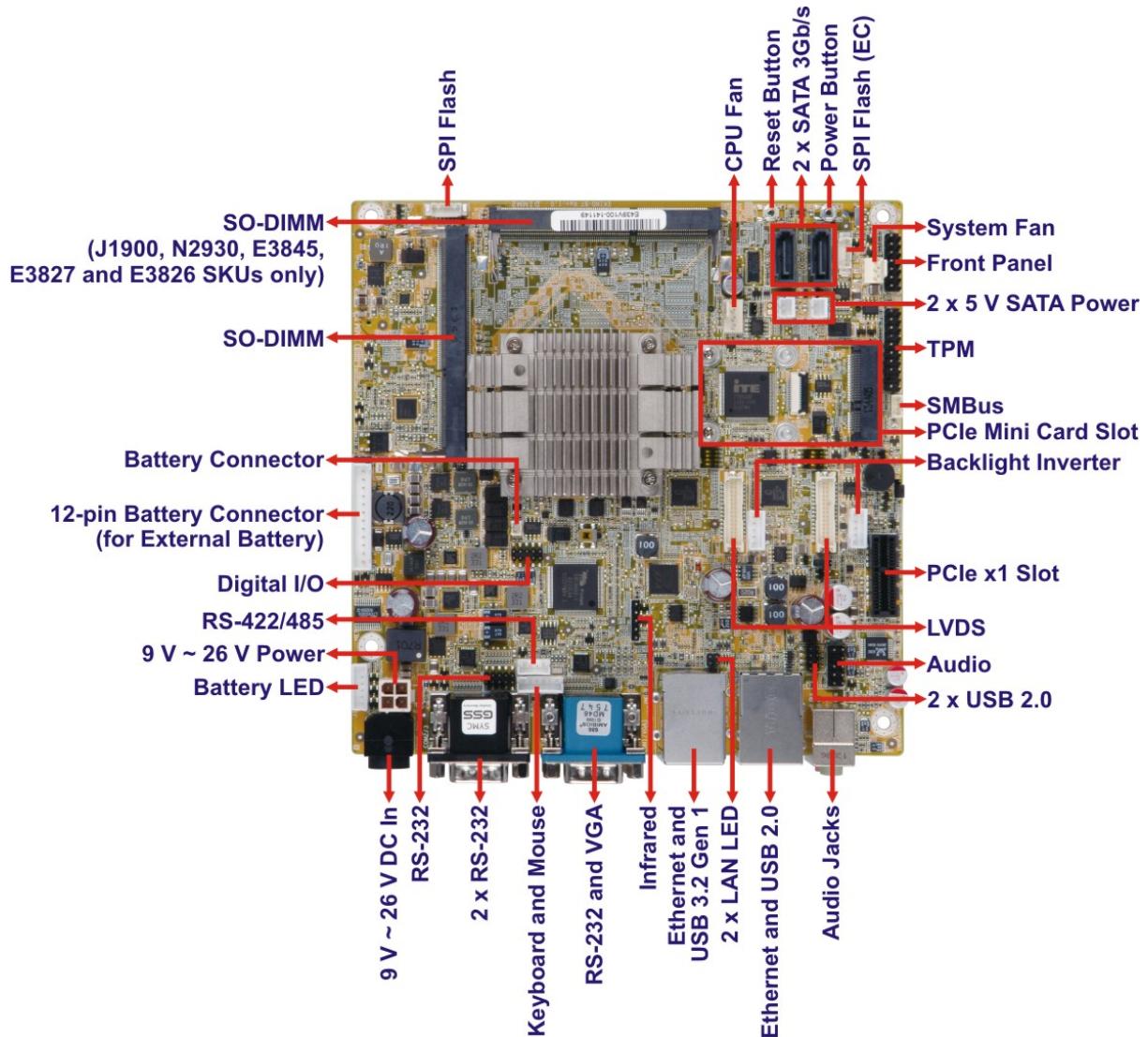


Figure 1-2: Connectors (Front Side)

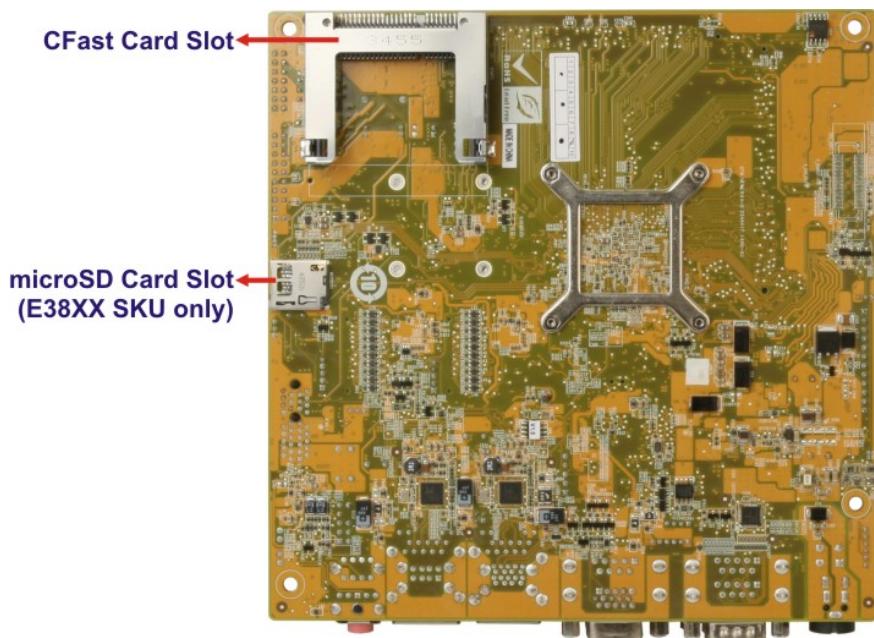
eKINO-BT Mini-ITX SBC

Figure 1-3: Connectors (Solder Side)

1.5 Dimensions

The main dimensions of the eKINO-BT are shown in the diagram below.

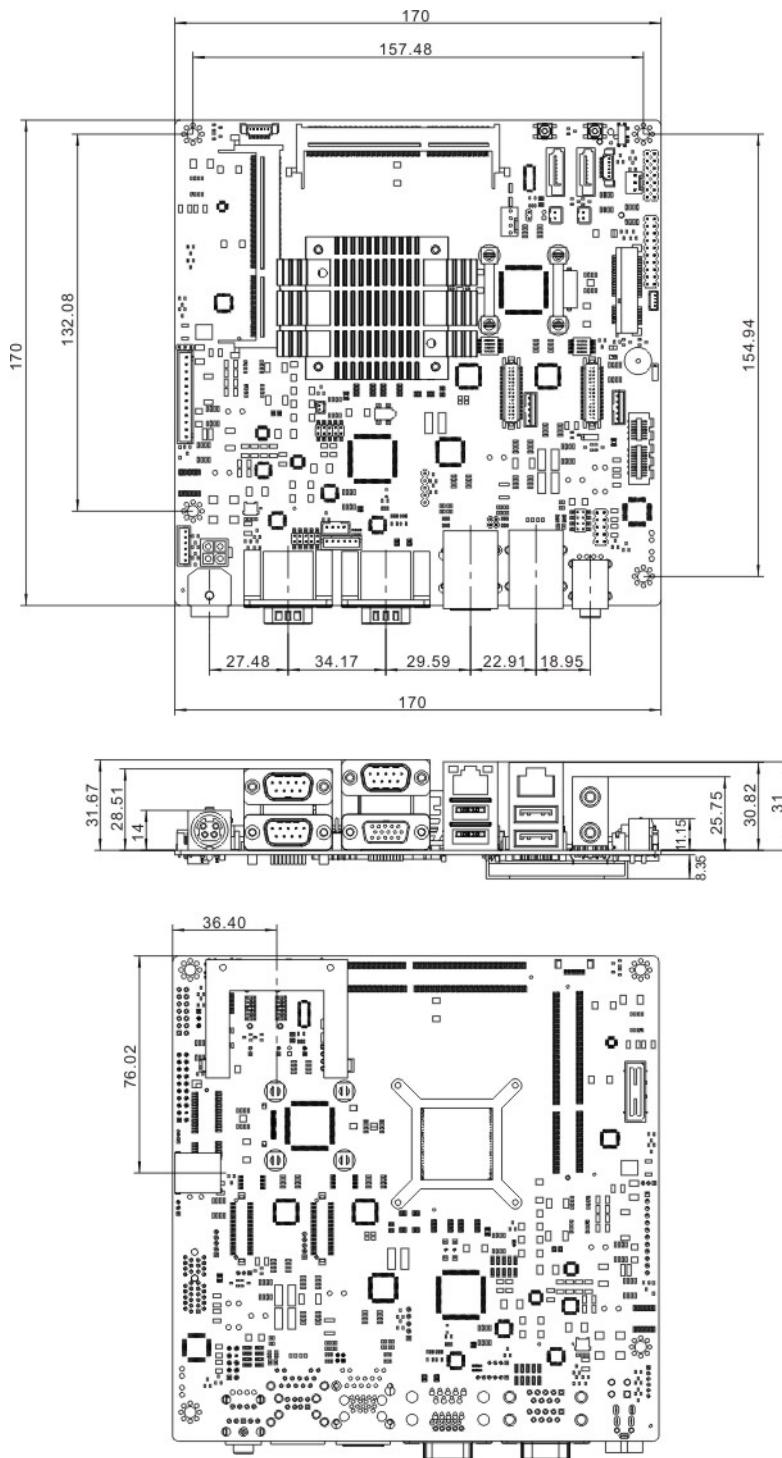


Figure 1-4: eKINO-BT Dimensions (mm)

eKINO-BT Mini-ITX SBC

1.6 Data Flow

Figure 1-5 shows the data flow between the system chipset, the CPU and other components installed on the motherboard.

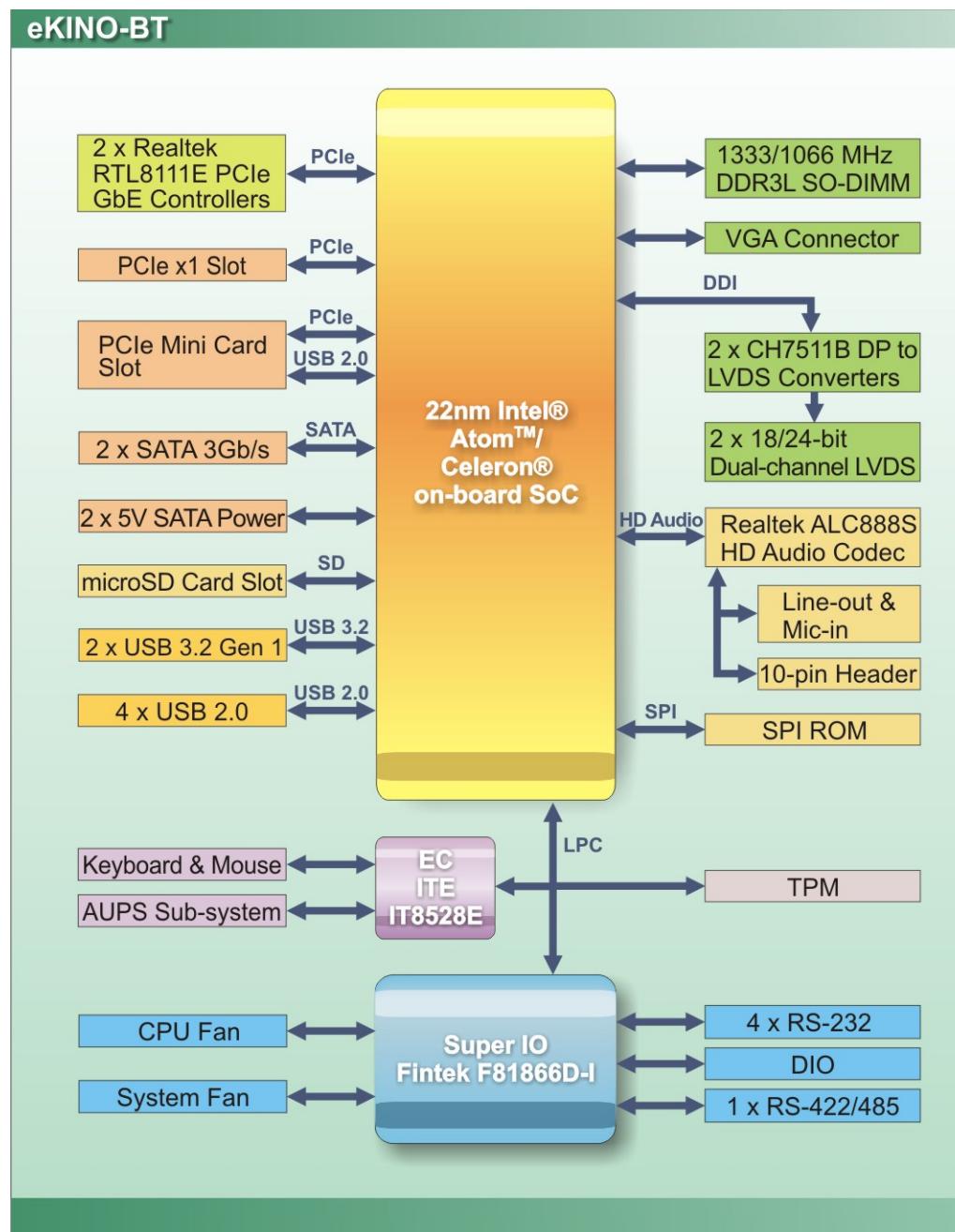


Figure 1-5: Data Flow Diagram

1.7 Technical Specifications

The eKINO-BT technical specifications are listed in **Table 1-2**.

Specification/Model	eKINO-BT
Form Factor	Mini-ITX
Onboard SoC	Intel® Atom™ E3845 (1.91GHz, quad-core, 2MB cache, TDP=10W) Intel® Atom™ E3827 (1.75GHz, dual-core, 1MB cache, TDP=8W) Intel® Atom™ E3826 (1.46GHz, dual-core, 1MB cache, TDP=7W) Intel® Atom™ E3825 (1.33GHz, dual-core, 1MB cache, TDP=6W) Intel® Atom™ E3815 (1.46GHz, single-core, 512KB cache, TDP=5W) Intel® Celeron® J1900 (2GHz, quad-core, 2MB cache, TDP=10W) Intel® Celeron® N2930 (1.83GHz, quad-core, 2MB cache, TDP=7.5W) Intel® Celeron® N2807 (1.58GHz, dual-core, 2MB cache, TDP=4.5W)
Memory	For J1900, N2930, E3845, E3827and E3826 SKUs: Two 204-pin 1333/1066 MHz dual-channel unbuffered DDR3L SDRAM SO-DIMM slots support up to 8 GB For N2807, E3825 and E3815 SKUs: One 204-pin 1333/1066 MHz unbuffered DDR3L SDRAM SO-DIMM slot supports up to 4 GB * Use DIMM1 slot when installing one SO-DIMM. For the SO-DIMM slot location, refer to Figure 3-28.
Graphics Engine	Intel® HD Graphics Gen 7 with 4 execution units, supporting DirectX 11.1, OpenCL 1.2 and OpenGL 4.2
Display Output	One VGA (up to 2560x1600@60 Hz) Two 18/24-bit dual-channel LVDS* by CH7511B DP to LVDS converters (up to 1920x1200@60 Hz) * The eKINO-BT supports only one LCD when using the optional 7.4 V battery (BATKIT-2S2P3800-R10/BAT-LI-2S2P3800).
BIOS	AMI UEFI BIOS E439AIxx BIOS version is for E38XX SKUs E439AMxx BIOS version is for J1900, N2930 and N2807 SKUs

eKINO-BT Mini-ITX SBC

Ethernet	Two Realtek RTL8111E PCIe GbE controllers
Audio	Realtek ALC888S HD Audio codec
Super I/O Controller	Fintek F81866D-I
Embedded Controller	ITE IT8528E
Watchdog Timer	Software programmable, supports 1~255 sec. system reset
Expansions	One full-size/half-size PCIe Mini card slot (with USB 2.0 signal) One PCIe x1 slot One CFast card slot One microSD card slot (E38XX SKU only)
I/O Interface Connectors	
Audio Connectors	Line-out and mic-in audio jacks on rear panel One front panel audio connector (10-pin header)
Battery Connectors	One 2-pin wafer connector One 12-pin wafer connector (for AUPS battery)
Digital I/O	One 8-bit digital I/O
Ethernet	Two RJ-45 GbE ports
Fan Connectors	One 4-pin wafer connector (CPU fan) One 3-pin wafer connector (system fan)
Front Panel	One 14-pin header (power LED, HDD LED, speaker, power button, reset button)
Keyboard and Mouse	One 6-pin wafer connector for PS/2 keyboard and mouse
LAN LEDs	Two 2-pin headers for LAN1 LED and LAN2 LED (link signal)
Serial ATA	Two SATA 3Gb/s connectors Two 5 V SATA power connectors
Serial Ports	Four RS-232 COM connectors (one by pin header, three on rear panel) One RS-422/485 COM connector (4-pin wafer)
SMBus	One 4-pin wafer connector

USB Ports	Two USB 3.2 Gen 1 (5Gb/s) ports on rear panel Four USB 2.0 ports (two on rear panel, two by pin headers)
TPM	One 20-pin header
Environmental and Power Specifications	
Power Supply	Input voltage range: 9 V ~ 26 V Recommended operating input voltage range: 12 V ~ 24 V One external 4-pin DIN DC jack One internal 4-pin (2x2) power connector
Power Consumption	+12V@1.55A (Intel® Celeron® J1900 CPU with two 4 GB 1333 MHz DDR3L memory)
Operating Temperature	0°C ~ 40°C (with AUPS sub-system) -20°C ~ 60°C (without AUPS sub-system)
Storage Temperature	-10°C ~ 50°C (with AUPS sub-system) -30°C ~ 70°C (without AUPS sub-system)
Operating Humidity	5% ~ 95% (non-condensing)
Physical Specifications	
Dimensions	170 mm x 170 mm
Weight (GW/NW)	1100 g/400 g

Table 1-2: Technical Specifications

Chapter

2

Packing List

2.1 Anti-static Precautions



WARNING!

Static electricity can destroy certain electronics. Make sure to follow the ESD precautions to prevent damage to the product, and injury to the user.

Make sure to adhere to the following guidelines:

- **Wear an anti-static wristband:** Wearing an anti-static wristband can prevent electrostatic discharge.
- **Self-grounding:** Touch a grounded conductor every few minutes to discharge any excess static buildup.
- **Use an anti-static pad:** When configuring any circuit board, place it on an anti-static mat.
- **Only handle the edges of the PCB:** Don't touch the surface of the motherboard. Hold the motherboard by the edges when handling.

2.2 Unpacking Precautions

When the eKINO-BT is unpacked, please do the following:

- Follow the anti-static guidelines above.
- Make sure the packing box is facing upwards when opening.
- Make sure all the packing list items are present.

2.3 Packing List

**NOTE:**

If any of the components listed in the checklist below are missing, do not proceed with the installation. Contact the IEI reseller or vendor the eKINO-BT was purchased from or contact an IEI sales representative directly by sending an email to sales@ieiworld.com.

The eKINO-BT is shipped with the following components:

Quantity	Item and Part Number	Image
1	eKINO-BT SBC	
2	SATA signal and power cable (P/N: 32801-000201-300-RS)	
1	I/O shielding (P/N: 45014-0052C0-00-RS)	
1	Quick installation guide	

Table 2-1: Packing List

2.4 Optional Items

These optional items are available.

Item and Part Number	Image
12 V, 60 W power adapter (90 V AC ~ 260 V AC, 4-pin DIN) (P/N: 63040-010060-110-RS)	
19 V, 120 W power adapter (90 V AC ~ 264 V AC, 4-pin DIN) (P/N: 63040-010120-210-RS)	
4S2P AUPS battery kit (14.8 V, 3800 mAh) (P/N: BATKIT-4S2P3800-R10)	
4S2P smart battery (14.8 V, 3800 mAh) (P/N: BAT-LI-4S2P3800)	
2S2P AUPS battery kit (7.4 V, 3800 mAh) (P/N: BATKIT-2S2P3800-R10)	
2S2P smart battery (7.4 V, 3800 mAh) (P/N: BAT-LI-2S2P3800)	
RS-422/485 cable (P/N: 32205-003800-300-RS)	
PS/2 keyboard and mouse Y cable (P/N: 32000-023800-RS)	

Table 2-2: Optional Items



NOTE:

The eKINO-BT supports only one LCD when using the optional 7.4 V battery (BATKIT-2S2P3800-R10/BAT-LI-2S2P3800).

Chapter

3

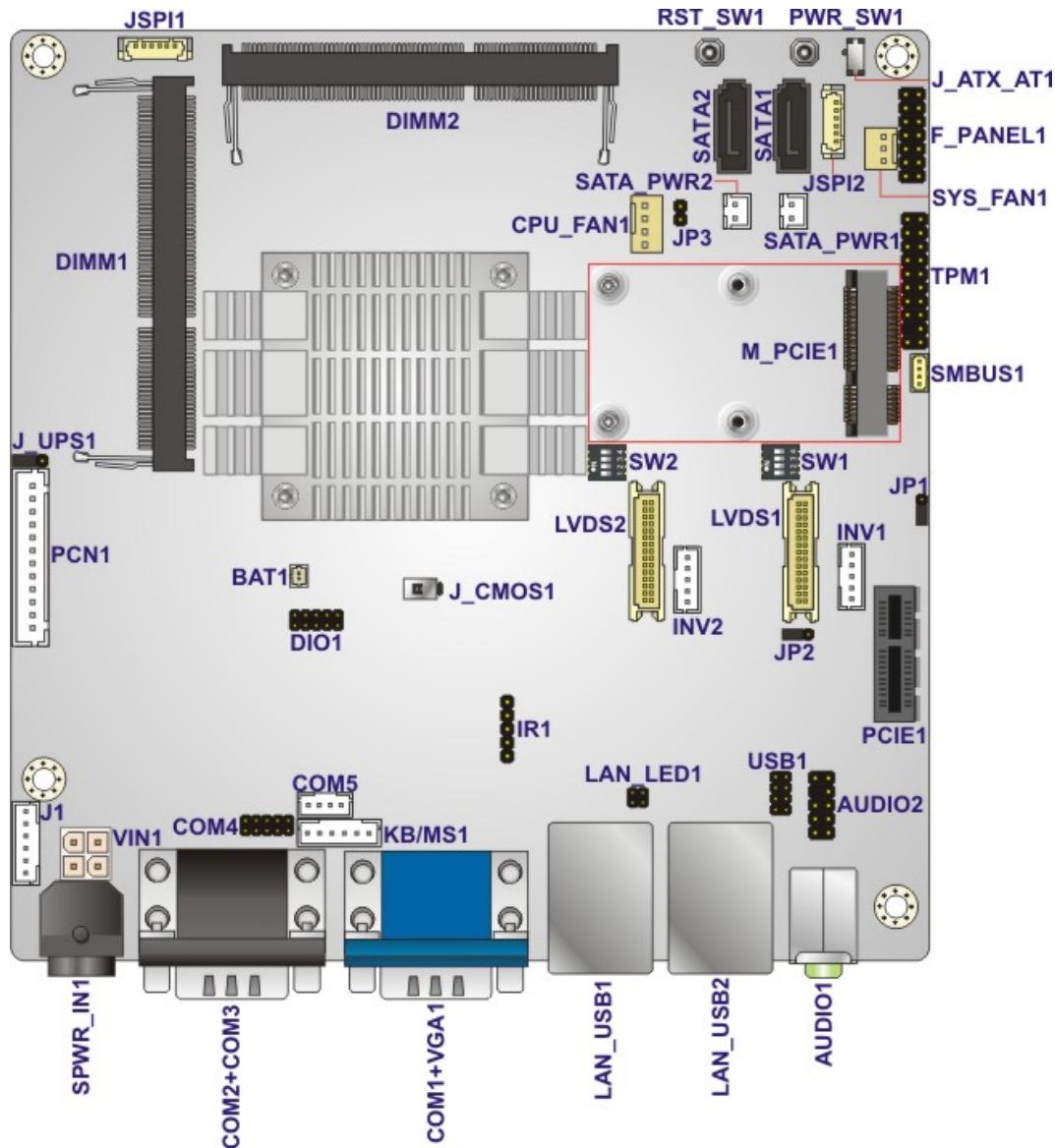
Connectors

3.1 Peripheral Interface Connectors

This chapter details all the peripheral interface connectors.

3.1.1 Layout

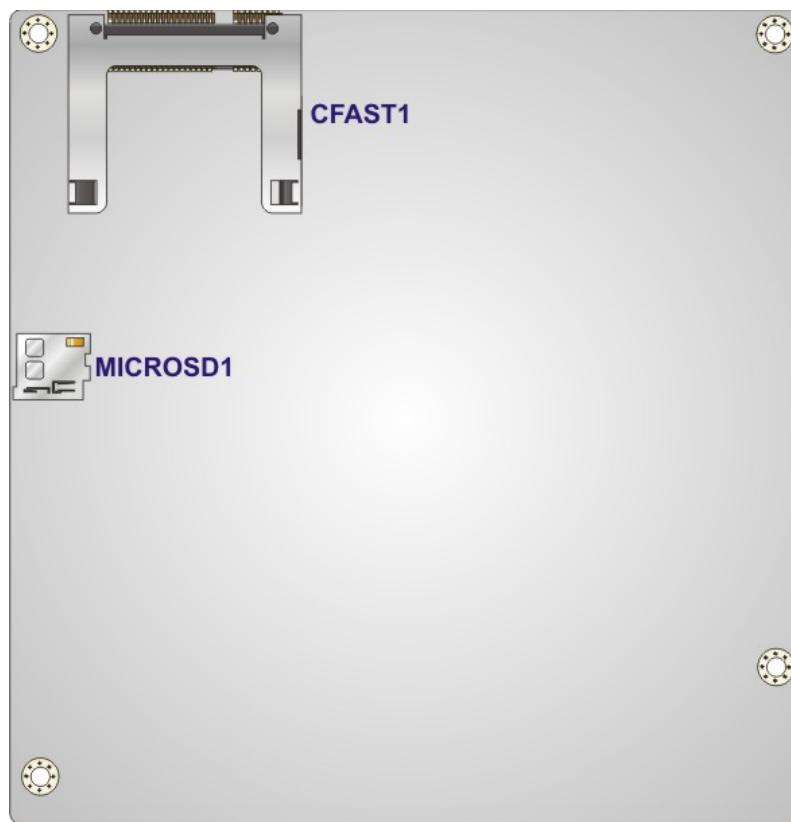
The figures below show all the peripheral interface connectors.



*DIMM2 slot is available for J1900, N2930, E3845, E3827 and E3826 SKUs only.

Figure 3-1: Peripheral Interface Connectors (Front Side)

eKINO-BT Mini-ITX SBC



*MICROSD1 slot is available for E38XX SKU only.

Figure 3-2: Peripheral Interface Connectors (Solder Side)

3.1.2 Peripheral Interface Connectors

The table below shows a list of the peripheral interface connectors on the eKINO-BT. Detailed descriptions of these connectors can be found below.

Connector	Type	Label
9 V ~ 26 V power connector	4-pin Molex power connector	VIN1
12-pin battery connector	12-pin wafer	PCN1
Audio connector	10-pin header	AUDIO2
Backlight inverter connectors	5-pin wafer	INV1, INV2
Battery connector	2-pin wafer	BAT1
Battery LED connector	6-pin wafer	J1

Connector	Type	Label
CFast card slot	CFast card slot	CFAST1
Digital I/O connector	10-pin header	DIO1
Fan connector (CPU)	4-pin wafer	CPU_FAN1
Fan connector (system)	3-pin wafer	SYS_FAN1
Front panel connector	14-pin header	F_PANEL1
Infrared connector	5-pin header	IR1
Keyboard and mouse connector	6-pin wafer	KB_MS1
LAN active LED connector	4-pin header	LAN_LED1
LVDS connectors	30-pin crimp	LVDS1, LVDS2
microSD card slot	microSD card slot	MICROSD1
PCIe x1 slot	PCIe x1 slot	PCIE1
PCIe Mini card slot	PCIe Mini card slot	M_PCIE1
Power button (on-board)	Push button	PWR_SW1
Reset button (on-board)	Push button	RST_SW1
SATA 3Gb/s connectors	7-pin SATA connector	SATA1, SATA2
SATA power connectors (5 V)	2-pin wafer	SATA_PWR1, SATA_PWR2
Serial port, RS-232	10-pin header	COM4
Serial port, RS-422/485	4-pin wafer	COM5
SMBus connector	4-pin wafer	SMBUS1
SO-DIMM connectors	204-pin DDR3L SO-DIMM connector	DIMM1, DIMM2
SPI flash connector	6-pin wafer	JSPI1
SPI flash connector (EC)	6-pin wafer	JSPI2
TPM connector	20-pin header	TPM1
USB 2.0 connector	8-pin header	USB1

Table 3-1: Peripheral Interface Connectors

3.1.3 External Interface Panel Connectors

The table below lists the rear panel connectors on the eKINO-BT. Detailed descriptions of these connectors can be found in a later section.

Connector	Type	Label
9 V ~ 26 V DC in connector	4-pin mini-DIN	SPWR_IN1
Audio jacks (mic-in, line-out)	Audio jack	AUDIO1
Ethernet and USB 2.0 connectors	RJ-45 and USB 2.0	LAN_USB2
Ethernet and USB 3.2 Gen 1 connectors	RJ-45 and USB Type-A	LAN_USB1
RS-232 serial ports	DB-9	COM1, COM2, COM3
VGA connector	15-pin female	VGA1

Table 3-2: Rear Panel Connectors

3.2 Internal Peripheral Connectors

Internal peripheral connectors are found on the motherboard and are only accessible when the motherboard is outside of the chassis. This section has complete descriptions of all the internal, peripheral connectors on the eKINO-BT.

3.2.1 9 V ~ 26 V Power Connector

CN Label: VIN1

CN Type: 4-pin Molex power connector

CN Location: See [Figure 3-3](#)

CN Pinouts: See [Table 3-3](#)

This connector provides power to the system.

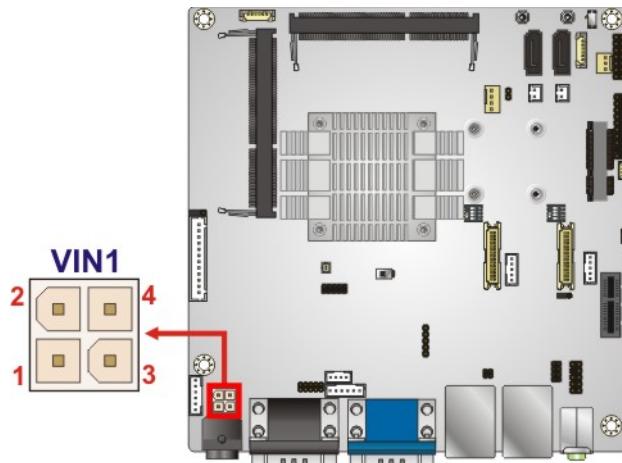


Figure 3-3: 9 V ~ 26 V Power Connector Location

Pin	Description	Pin	Description
1	GND	2	GND
3	Power (9 V ~ 26 V)	4	Power (9 V ~ 26 V)

Table 3-3: 9 V ~ 26 V Power Connector Pinouts

3.2.2 12-pin Battery Connector

CN Label: PCN1

CN Type: 12-pin connector

CN Location: See Figure 3-4

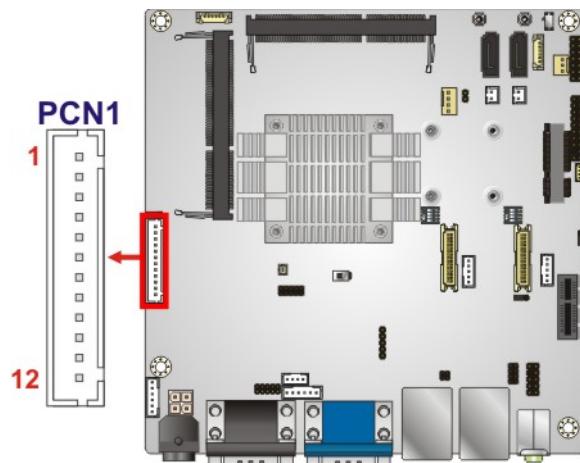
CN Pinouts: See Table 3-4

The 12-pin battery connector allows connection of the AUPS battery. When the AUPS battery is installed to the system, a battery icon will be shown on the Windows notification area.



NOTE:

The eKINO-BT supports only one LCD when using the optional 7.4 V battery (BATKIT-2S2P3800-R10/BAT-LI-2S2P3800).

eKINO-BT Mini-ITX SBC**Figure 3-4: 12-pin Battery Connector Location**

Pin	Description
1	VBAT
2	VBAT
3	VBAT
4	VBAT
5	BAT_SMBCLK
6	BAT_SMBDATA
7	BAT_TH
8	BAT_ID
9	GND
10	GND
11	GND
12	GND

Table 3-4: 12-pin Battery Connector Pinouts

3.2.3 Audio Connector

CN Label: AUDIO2

CN Type: 10-pin header

CN Location: See **Figure 3-5**

CN Pinouts: See **Table 3-5**

This connector connects to speakers, a microphone and an audio input.

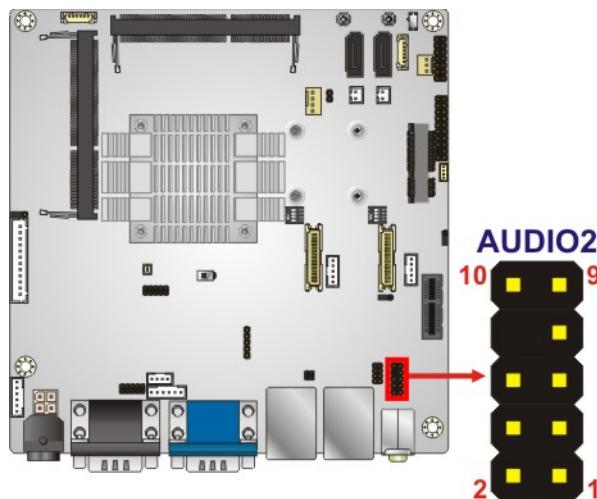


Figure 3-5: Audio Connector Location

Pin	Description	Pin	Description
1	LMIC2-L	2	ANALOG GND
3	LMIC2-R	4	PRESENCE#
5	LLINE2-R	6	MIC2-JD
7	FRONT-IO	8	NC
9	LLINE2-L	10	LINE2-JD

Table 3-5: Audio Connector Pinouts

3.2.4 Backlight Inverter Connectors

CN Label: INV1, INV2

CN Type: 5-pin wafer

CN Location: See **Figure 3-6**

CN Pinouts: See **Table 3-6**

Each backlight inverter connector provides power to an LCD panel.

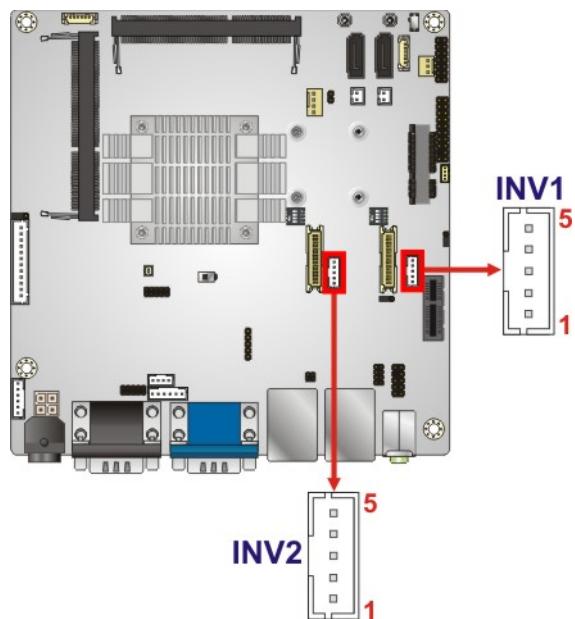


Figure 3-6: Backlight Inverter Connector Locations

Pin	Description
1	LCD_BKLTCTL
2	GROUND
3	+12V
4	GROUND
5	BACKLIGHT ENABLE

Table 3-6: Backlight Inverter Connector Pinouts

3.2.5 Battery Connector



CAUTION:

Risk of explosion if battery is replaced by an incorrect type. Only certified engineers should replace the on-board battery.

Dispose of used batteries according to instructions and local regulations.

CN Label: BAT1

CN Type: 2-pin wafer

CN Location: See **Figure 3-7**

CN Pinouts: See **Table 3-7**

This is connected to the system battery. The battery provides power to the system clock to retain the time when power is turned off. **NOTE:** It is recommended to attach the RTC battery onto the system chassis in which the eKINO-BT is installed.

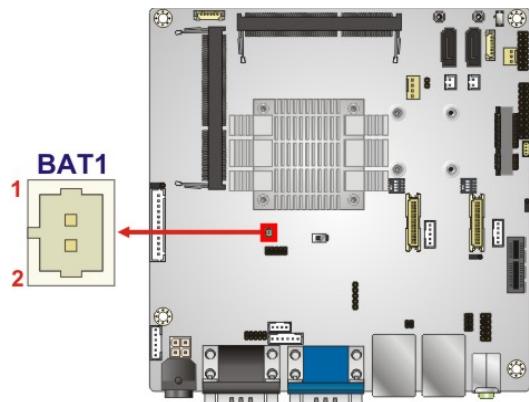


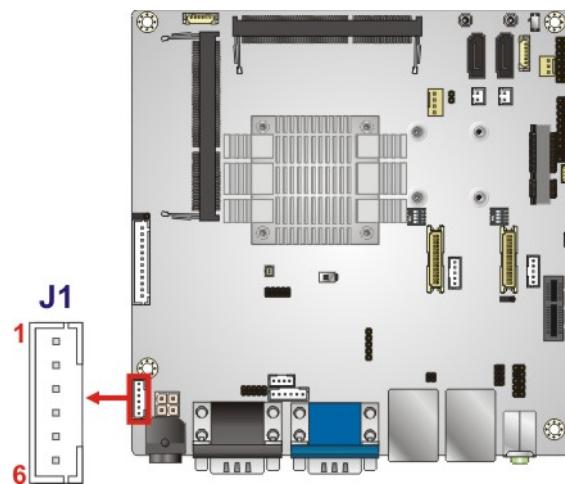
Figure 3-7: Battery Connector Location

Pin	Description
1	VBATT
2	GND

Table 3-7: Battery Connector Pinouts

eKINO-BT Mini-ITX SBC**3.2.6 Battery LED Connector****CN Label:** J1**CN Type:** 6-pin wafer**CN Location:** See **Figure 3-8****CN Pinouts:** See **Table 3-8**

The LED connector connects to LED indicators showing the status of the connected battery kit.

**Figure 3-8: Battery LED Connector Location**

Pin	Description
1	VCC5
2	DISCHARGING LED
3	VCC5
4	CHARGING LED
5	VCC5
6	DC IN LED

Table 3-8: Battery LED Connector Pinouts

3.2.7 CFast Card Slot

CN Label: CFAST1

CN Type: CFast card slot

CN Location: See **Figure 3-9**

The CFast card slot is for installing a CFast card to the system.

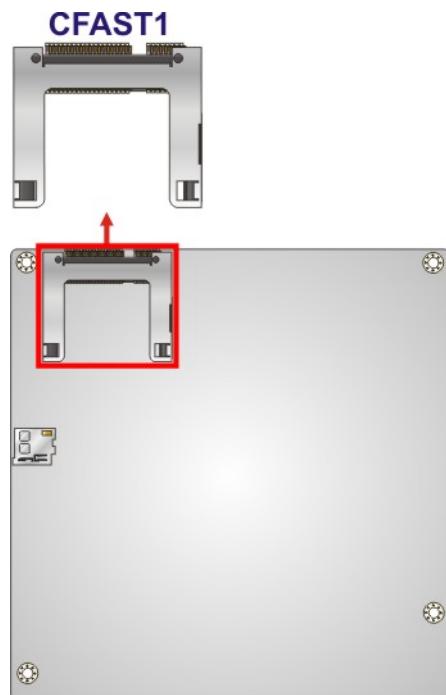
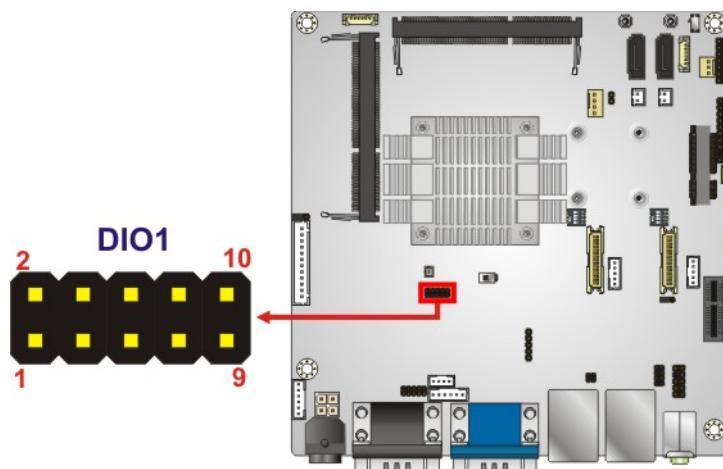


Figure 3-9: CFast Card Slot Location

eKINO-BT Mini-ITX SBC**3.2.8 Digital I/O Connector****CN Label:** DIO1**CN Type:** 10-pin header**CN Location:** See **Figure 3-10****CN Pinouts:** See **Table 3-9**

The digital I/O connector provides programmable input and output for external devices.

**Figure 3-10: Digital I/O Connector Location**

Pin	Description	Pin	Description
1	GND	2	+V5S
3	Output 3	4	Output 2
5	Output 1	6	Output 0
7	Input 3	8	Input 2

Pin	Description	Pin	Description
9	Input 1	10	Input 0

Table 3-9: Digital I/O Connector Pinouts

3.2.9 Fan Connector (CPU)

CN Label: CPU_FAN1

CN Type: 4-pin wafer

CN Location: See Figure 3-11

CN Pinouts: See Table 3-10

The fan connector attaches to a CPU cooling fan.

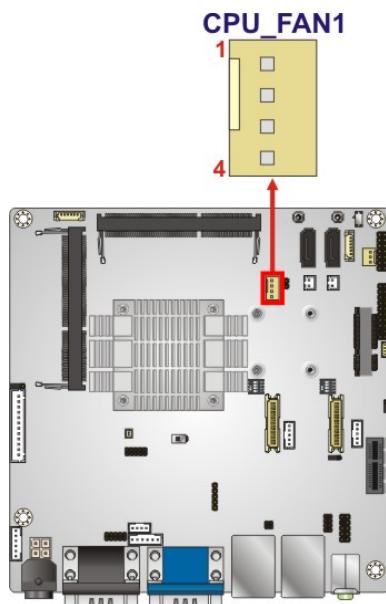


Figure 3-11: CPU Fan Connector Location

Pin	Description
1	GND
2	+V12S
3	Rotation Signal
4	PWM Control Signal

Table 3-10: CPU Fan Connector Pinouts

eKINO-BT Mini-ITX SBC**3.2.10 Fan Connector (System)**

CN Label: SYS_FAN1

CN Type: 3-pin wafer

CN Location: See **Figure 3-12**

CN Pinouts: See **Table 3-11**

The fan connector attaches to a system cooling fan.

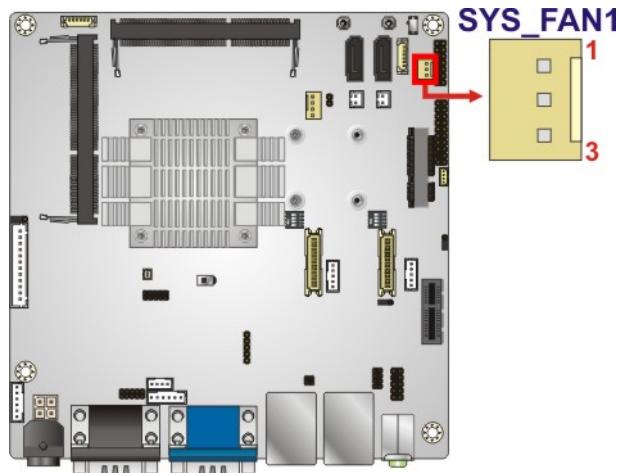


Figure 3-12: System Fan Connector Location

Pin	Description
1	Rotation Signal
2	+12V
3	GND

Table 3-11: System Fan Connector Pinouts

3.2.11 Front Panel Connector

CN Label: F_PANEL1

CN Type: 14-pin header

CN Location: See **Figure 3-13**

CN Pinouts: See **Table 3-12**

The front panel connector connects to the indicator LEDs and buttons on the computer's front panel.

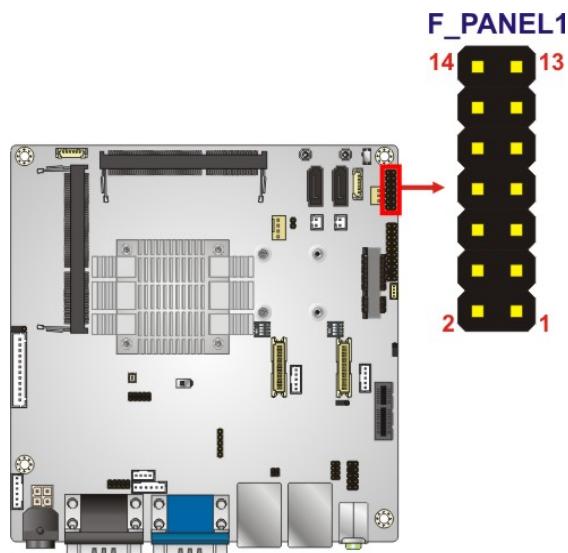


Figure 3-13: Front Panel Connector Location

Function	Pin	Description	Function	Pin	Description
Power LED	1	LED_PWR	Buzzer	2	BEEP_PWR
	3	NC		4	NC
	5	GND		6	NC
Power Button	7	PWR_BTN	Reset	8	PC_BEEP#
	9	GND		10	NC
HDD LED	11	HDD_LED+		12	RESET
	13	HDD_LED-		14	GND

Table 3-12: Front Panel Connector Pinouts

3.2.12 Infrared Interface Connector

CN Label: IR1

CN Type: 5-pin header

CN Location: See **Figure 3-14**

CN Pinouts: See **Table 3-13**

The infrared connector attaches to an infrared receiver for use with remote controls.

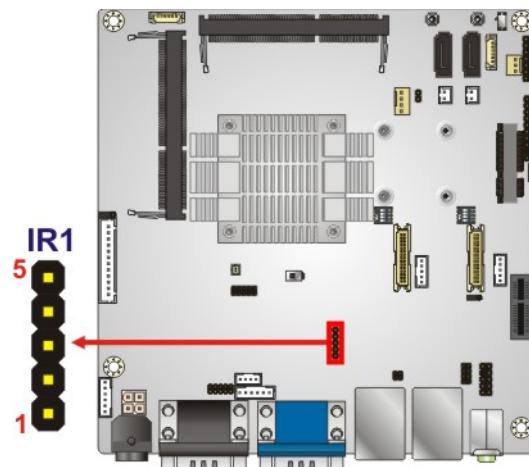


Figure 3-14: Infrared Connector Location

Pin	Description
1	+V5X
2	NC
3	IR-RX
4	GND
5	IR-TX

Table 3-13: Infrared Connector Pinouts

3.2.13 Keyboard and Mouse Connector

CN Label: KB_MS1

CN Type: 6-pin wafer

CN Location: See **Figure 3-15**

CN Pinouts: See **Table 3-14**

The keyboard and mouse connector connects to a PS/2 Y-cable that can be connected to a PS/2 keyboard and mouse.

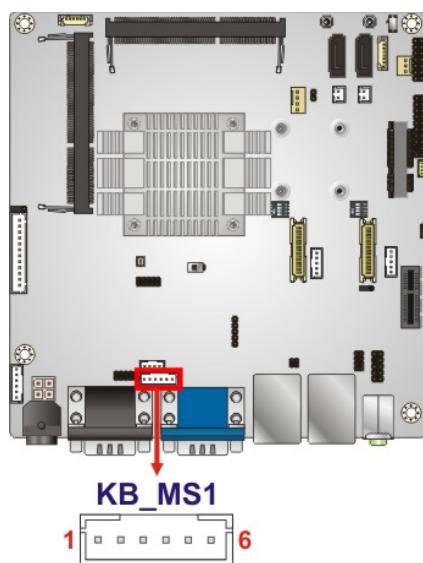


Figure 3-15: Keyboard and Mouse Connector Location

Pin	Description
1	VCC5_KBMS
2	Mouse Data
3	Mouse Clock
4	Keyboard Data
5	Keyboard Clock
6	GND

Table 3-14: Keyboard and Mouse Connector Pinouts

3.2.14 LAN Active LED Connector

CN Label: LAN_LED1

CN Type: 4-pin header

CN Location: See **Figure 3-16**

CN Pinouts: See **Table 3-15**

The LAN active LED connector is used to connect to the LAN LED indicators on the chassis to indicate users the link activities of the two LAN ports.

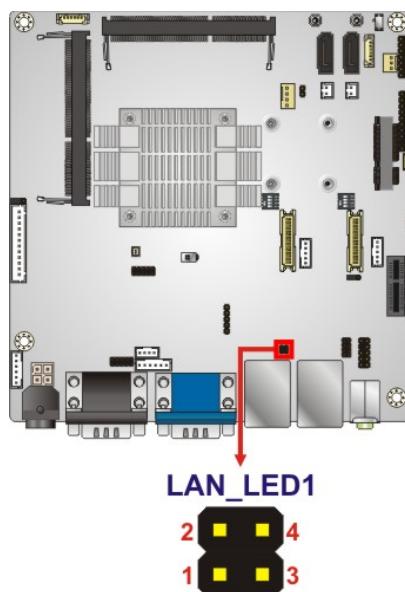


Figure 3-16: LAN Active LED Connector Location

Pin	Description
1	LAN1 LED LINK_ACT-
2	+V3.3LAN
3	LAN2 LED LINK_ACT-
4	+V3.3LAN

Table 3-15: LAN Active LED Connector Pinouts

3.2.15 LVDS Connectors

CN Label: LVDS1, LVDS2

CN Type: 30-pin crimp

CN Location: See **Figure 3-17**

CN Pinouts: See **Table 3-16**

The LVDS connectors are for LCD panels connected to the board.



NOTE:

The eKINO-BT supports only one LCD when using the optional
7.4 V battery (BATKIT-2S2P3800-R10/BAT-LI-2S2P3800)

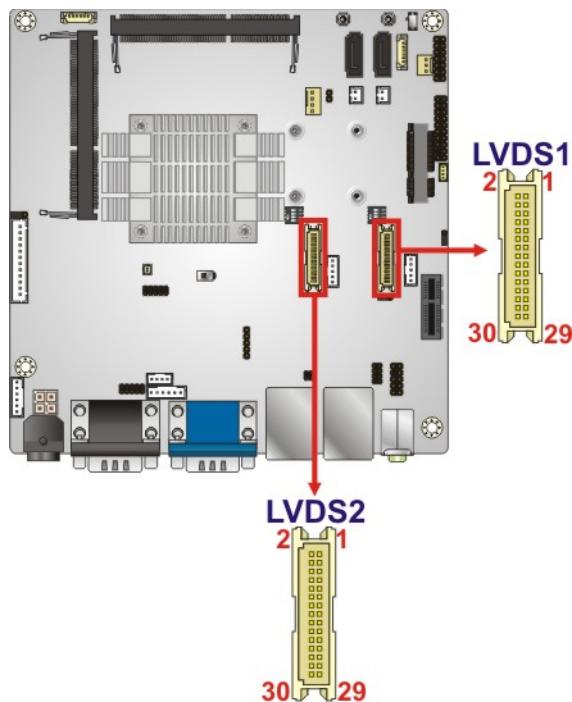


Figure 3-17: LVDS Connector Locations

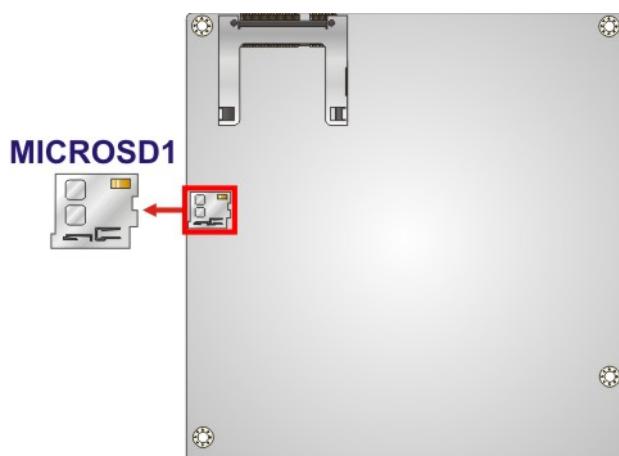
Pin	Description	Pin	Description
1	GND	2	GND
3	LVDS_A_TX0-P	4	LVDS_A _TX0-N
5	LVDS_A_TX1-P	6	LVDS_A _TX1-N

eKINO-BT Mini-ITX SBC

Pin	Description	Pin	Description
7	LVDS_A_TX2-P	8	LVDS_A_TX2-N
9	LVDS_A_TXCLK-P	10	LVDS_A_TXCLK-N
11	LVDS_A_TX3-P	12	LVDS_A_TX3-N
13	GND	14	GND
15	LVDS_B_TX0-P	16	LVDS_B_TX0-N
17	LVDS_B_TX1-P	18	LVDS_B_TX1-N
19	LVDS_B_TX2-P	20	LVDS_B_TX2-N
21	LVDS_B_TXCLK-P	22	LVDS_B_TXCLK-N
23	LVDS_B_TX3-P	24	LVDS_B_TX3-N
25	GND	26	GND
27	+LCD Vcc	28	+LCD Vcc
29	+LCD Vcc	30	+LCD Vcc

Table 3-16: LVDS Connector Pinouts**3.2.16 microSD Card Slot (E38XX SKU Only)****CN Label:** MICROSD1**CN Type:** microSD card slot**CN Location:** See **Figure 3-18**

The microSD card slot is for installing a microSD card to the system.

**Figure 3-18: microSD Card Slot Location**

3.2.17 PCIe x1 Slot

CN Label: PCIE1

CN Type: PCIe x1 slot

CN Location: See [Figure 3-19](#)

The PCIe x1 slot is for installing a PCIe x1 expansion card.

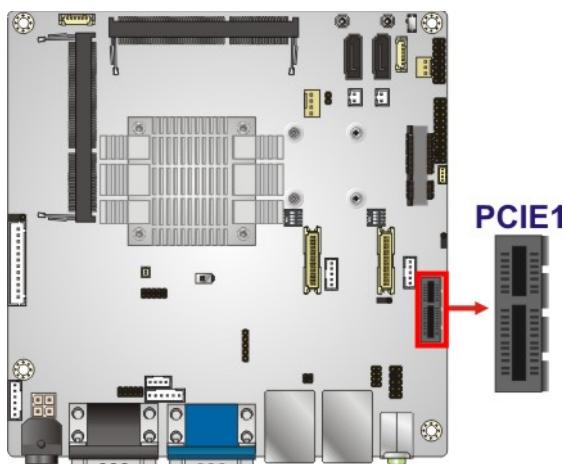


Figure 3-19: PCIe x1 Slot Location

3.2.18 PCIe Mini Card Slot

CN Label: M_PCIE1

CN Type: PCIe Mini card slot

CN Location: See [Figure 3-20](#)

CN Pinouts: See [Table 3-17](#)

The PCIe Mini card slot enables a full-size/half-size PCIe Mini card expansion module to be connected to the board.

eKINO-BT Mini-ITX SBC

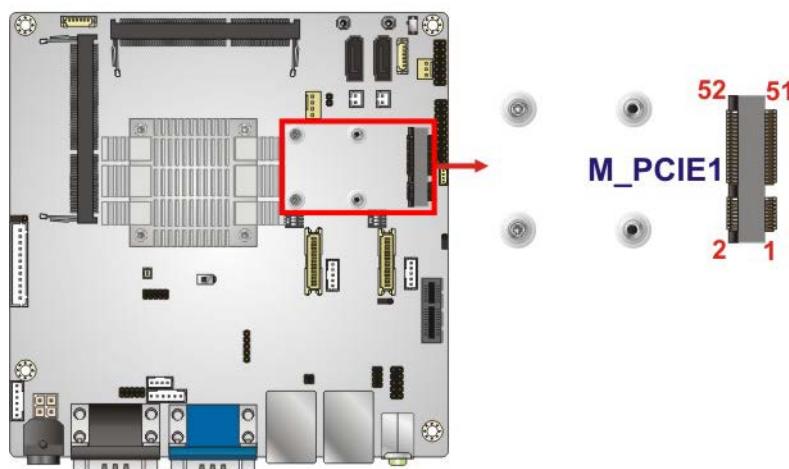


Figure 3-20: PCIe Mini Card Slot Location

Pin	Description	Pin	Description
1	PCIE_WAKE#	2	VCC3
3	N/C	4	GND
5	N/C	6	1.5V
7	N/C	8	N/C
9	GND	10	N/C
11	CLK-	12	N/C
13	CLK+	14	N/C
15	GND	16	N/C
17	PCIRST#	18	GND
19	N/C	20	VCC3
21	GND	22	PCIRST#
23	PERN2	24	3VDual
25	PERP2	26	GND
27	GND	28	1.5V
29	GND	30	SMBCLK
31	PETN2	32	SMBDATA
33	PETP2	34	GND
35	GND	36	USBD-
37	N/C	38	USBD+
39	N/C	40	GND

Pin	Description	Pin	Description
41	N/C	42	N/C
43	N/C	44	N/C
45	N/C	46	N/C
47	N/C	48	1.5V
49	N/C	50	GND
51	N/C	52	VCC3

Table 3-17: PCIe Mini Card Slot Pinouts

3.2.19 Power Button (On-board)

CN Label: PWR_SW1

CN Type: Push button

CN Location: See [Figure 3-21](#)

Push the on-board power button to power on the eKINO-BT.

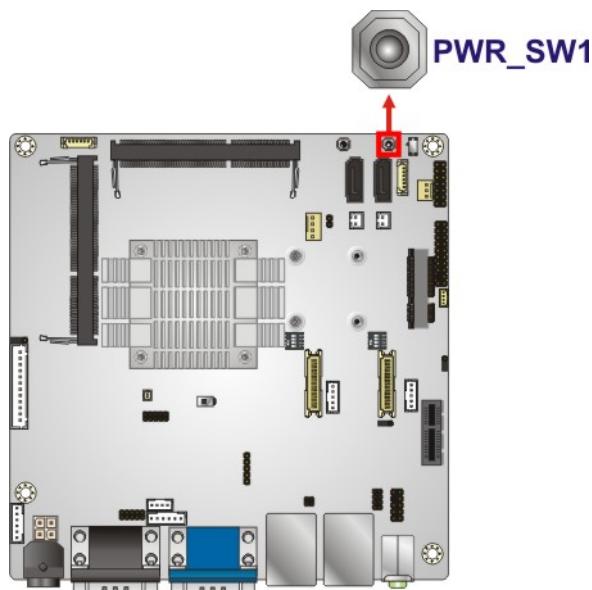


Figure 3-21: On-board Power Button Location

eKINO-BT Mini-ITX SBC**3.2.20 Reset Button (On-board)**

CN Label: RST_SW1

CN Type: Push button

CN Location: See **Figure 3-22**

Push the on-board reset button to reset the eKINO-BT.

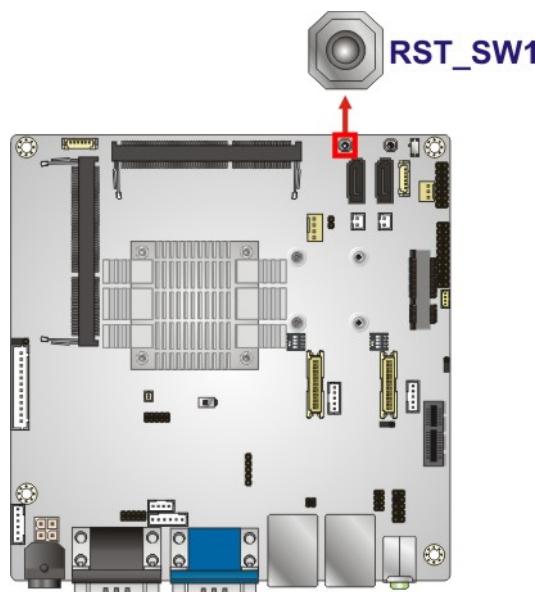


Figure 3-22: On-board Reset Button Location

3.2.21 SATA 3Gb/s Drive Connectors

CN Label: SATA1, SATA2

CN Type: 7-pin SATA connector

CN Location: See **Figure 3-23**

CN Pinouts: See **Table 3-18**

The SATA drive connectors can be connected to SATA drives and support up to 3Gb/s data transfer rate.

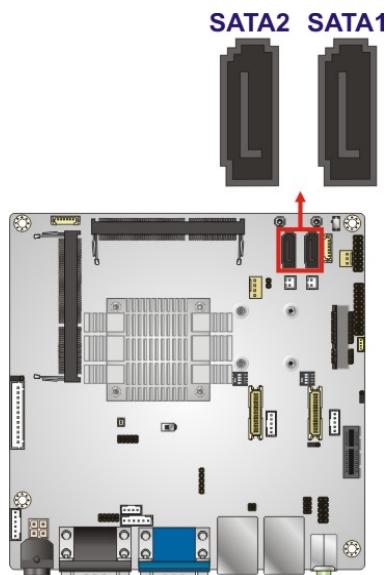


Figure 3-23: SATA 3Gb/s Drive Connector Locations

Pin	Description
1	GND
2	TX+
3	TX-
4	GND
5	RX-
6	RX+
7	GND

Table 3-18: SATA 3Gb/s Drive Connector Pinouts

3.2.22 SATA Power Connectors (5 V)

CN Label: SATA_PWR1, SATA_PWR2

CN Type: 2-pin wafer

CN Location: See **Figure 3-24**

CN Pinouts: See **Table 3-19**

Use the SATA power connector to connect to SATA device power connections.

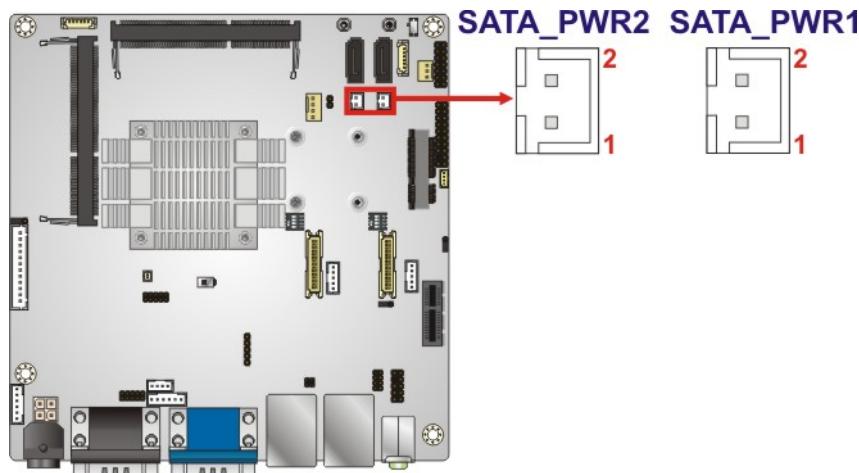


Figure 3-24: 5 V SATA Power Connector Locations

Pin	Description
1	+V5S
2	GND

Table 3-19: 5 V SATA Power Connector Pinouts

3.2.23 Serial Port Connector, RS-232

CN Label: COM4

CN Type: 10-pin header

CN Location: See **Figure 3-25**

CN Pinouts: See **Table 3-20**

The 10-pin serial port connector provides one RS-232 serial communications channel.

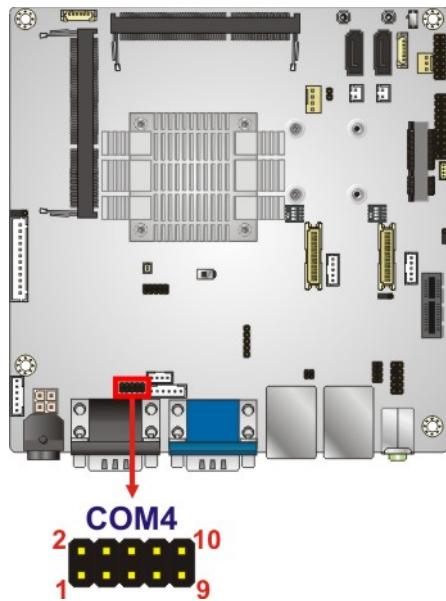


Figure 3-25: RS-232 Serial Port Connector Location

Pin	Description	Pin	Description
1	-NDCD2	2	-NDSRs
3	NSIN2	4	-NRTS2
5	NSOUT2	6	-NCTS2
7	-NDTR2	8	-XRI2
9	GND	10	GND

Table 3-20: RS-232 Serial Port Connector Pinouts

eKINO-BT Mini-ITX SBC

3.2.24 Serial Port Connector, RS-422/485

CN Label: COM5

CN Type: 4-pin wafer

CN Location: See **Figure 3-26**

CN Pinouts: See **Table 3-21**

This connector provides RS-422 or RS-485 communications.

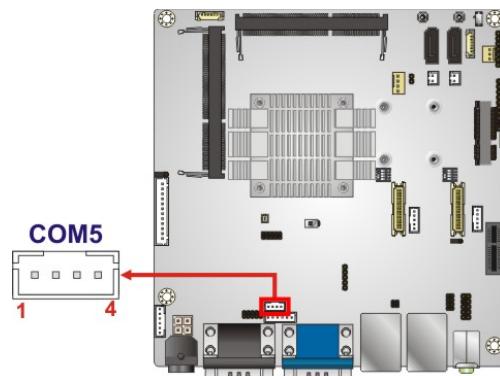


Figure 3-26: RS-422/485 Serial Port Connector Location

Pin	Description
1	RXD422-
2	RXD422+
3	TXD422+/TXD485+
4	TXD422-/TXD485-

Table 3-21: RS-422/485 Serial Port Connector Pinouts

Use the optional RS-422/485 cable to connect to a serial device. The pinouts of the DB-9 connector are listed below.

RS-422 Pinouts	RS-485 Pinouts

Table 3-22: DB-9 RS-422/485 Pinouts

3.2.25 SMBus Connector

CN Label: SMBUS1

CN Type: 4-pin wafer

CN Location: See **Figure 3-27**

CN Pinouts: See **Table 3-23**

The SMBus (System Management Bus) connector provides low-speed system management communications.

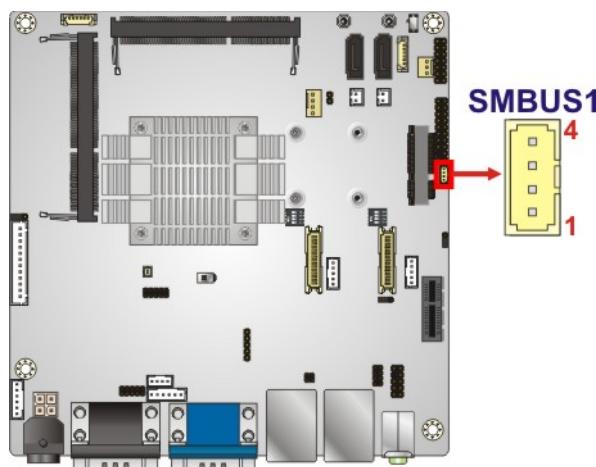


Figure 3-27: SMBus Connector Location

Pin	Description
1	GND
2	SMB_DATA
3	SMB_CLK
4	+V5S

Table 3-23: SMBus Connector Pinouts

3.2.26 SO-DIMM Connectors

CN Label: DIMM1, DIMM2

CN Type: 204-pin DDR3L SO-DIMM connector

CN Location: See **Figure 3-28**

The SO-DIMM connectors are for installing SO-DIMMs on the system.



NOTE:

Use **DIMM1** slot when installing one SO-DIMM.

For dual channel configuration, always install two identical memory modules that feature the same capacity, timings, voltage, number of ranks and the same brand.

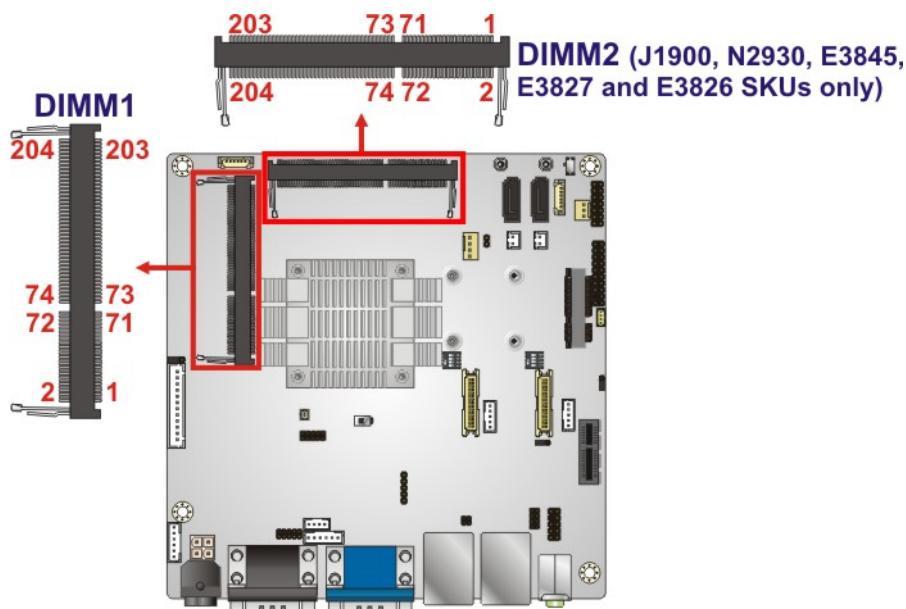


Figure 3-28: SO-DIMM Connector Locations

3.2.27 SPI Flash Connector

CN Label: JSPI1

CN Type: 6-pin wafer

CN Location: See **Figure 3-29**

CN Pinouts: See **Table 3-24**

The SPI flash connector is used to flash the SPI ROM.

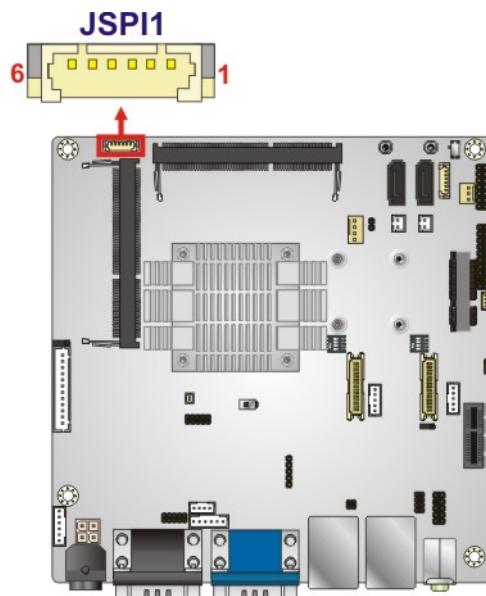


Figure 3-29: SPI Flash Connector Location

Pin	Description
1	+V3.3M_SPI_CON
2	SPI_CS
3	SPI_SO_SW
4	SPI_CLK_SW
5	SPI_SI_SW
6	GND

Table 3-24: SPI Flash Connector Pinouts

3.2.28 SPI Flash Connector (EC)

CN Label: JSPI2

CN Type: 6-pin wafer

CN Location: See **Figure 3-30**

CN Pinouts: See **Table 3-25**

The SPI flash connector is used to flash the EC ROM.

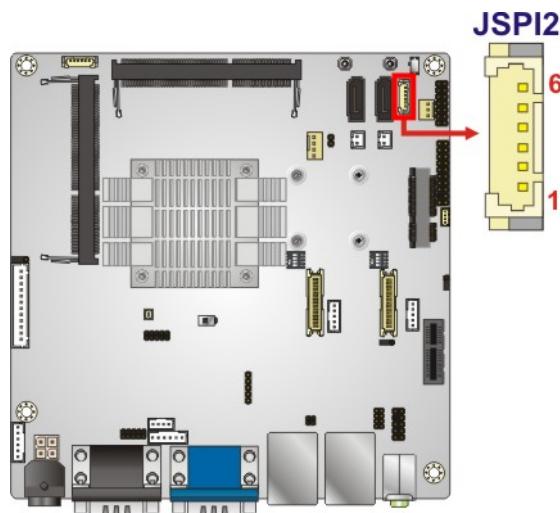


Figure 3-30: EC SPI Flash Connector Location

Pin	Description
1	+V3.3M_SPI_CON_EC
2	SPI_CS_EC
3	SPI_SO_SW_EC
4	SPI_CLK_SW_EC
5	SPI_SI_SW_EC
6	GND

Table 3-25: EC SPI Flash Connector Pinouts

3.2.29 TPM Connector

CN Label: TPM1

CN Type: 20-pin header

CN Location: See **Figure 3-31**

CN Pinouts: See **Table 3-26**

The TPM connector connects to a TPM module.

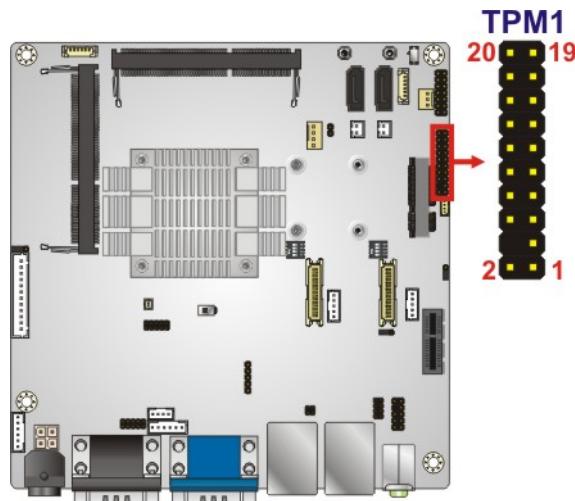


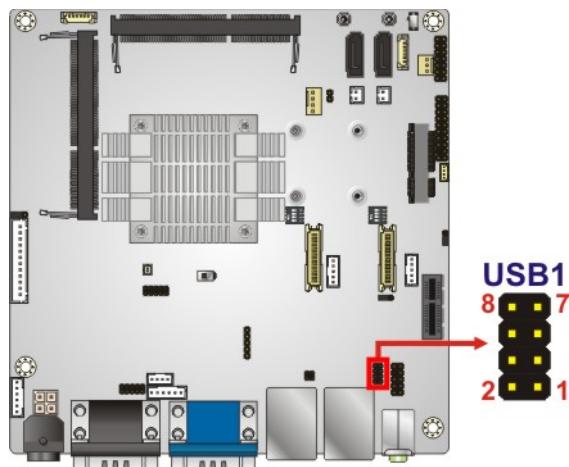
Figure 3-31: TPM Connector Location

Pin	Description	Pin	Description
1	LCLK	2	GND
3	LFRAME#	4	KEY
5	LRERST#	6	+5V
7	LAD3	8	LAD2
9	+3V	10	LAD1
11	LADO	12	GND
13	SCL	14	SDA
15	SB3V	16	SERIRQ
17	GND	18	GLKRUN#
19	LPCPD#	20	LDRQ#

Table 3-26: TPM Connector Pinouts

eKINO-BT Mini-ITX SBC**3.2.30 USB 2.0 Connector****CN Label:** USB1**CN Type:** 8-pin header**CN Location:** See **Figure 3-32****CN Pinouts:** See **Table 3-27**

The USB header can connect to two USB 2.0 devices.

**Figure 3-32: USB Connector Location**

Pin	Description	Pin	Description
1	VCC	2	GND
3	DATA-	4	DATA+
5	DATA+	6	DATA-
7	GND	8	VCC

Table 3-27: USB 2.0 Port Connector Pinouts

3.3 External Interface Connectors

The figure below shows the external peripheral interface connector (EPIC) panel. The EPIC panel consists of the following:

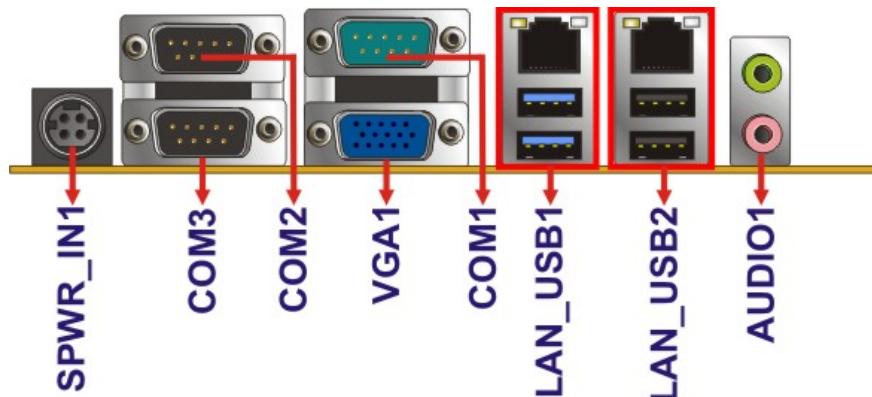


Figure 3-33: External Interface Connectors

3.3.1 9 V ~ 26 V DC In Connector

CN Label: SPWR_IN1

CN Type: 4-pin mini-DIN

CN Location: See Figure 3-33

CN Pinouts: See Table 3-36

The power connector connects to the 9 V ~ 26 V DC power adapter.

Pin	Description	Pin	Description
1	Power (9 V ~ 26 V)	2	GND
3	Power (9 V ~ 26 V)	4	GND

Table 3-28: 9 V ~ 26 V DC In Connector Pinouts



Figure 3-34: 9 V ~ 26 V DC In Connector

eKINO-BT Mini-ITX SBC

3.3.2 Audio Jacks

CN Label: AUDIO1

CN Type: Audio jack

CN Location: See **Figure 3-33**

The audio jacks connect to external audio devices.

- **Line Out port (Lime):** Connects to a headphone or a speaker. With multi-channel configurations, this port can also connect to front speakers.
- **Microphone (Pink):** Connects a microphone.



Figure 3-35: Audio Jacks

3.3.3 Ethernet and USB 2.0 Connectors

CN Label: LAN_USB2

CN Type: RJ-45 and USB 2.0 connector

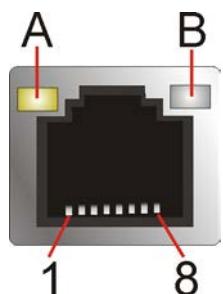
CN Location: See **Figure 3-33**

CN Pinouts: See **Table 3-29** and **Table 3-31**

The Ethernet connector connects to a local network.

Pin	Description	Pin	Description
1	MD0+	2	MD0-
3	MD1+	4	MD1-
5	MD2+	6	MD2-
7	MD3+	8	MD3-
9	VCC	10	GND
11	LINK_ACT+	12	LINK_ACT-
13	100-	14	1000-

Pin	Description	Pin	Description
15	GND		

Table 3-29: LAN Pinouts**Figure 3-36: Ethernet Connector**

LED	Description	LED	Description
A	on: linked blinking: data is being sent/received	B	off: 10 Mb/s green: 100 Mb/s orange: 1000 Mb/s

Table 3-30: Ethernet Connector LEDs

The eKINO-BT has two external USB 2.0 ports.

Pin	Description
1	VBUS
2	D1-
3	D1+
4	GND

Table 3-31: External USB 2.0 Port Pinouts

3.3.4 Ethernet and USB 3.2 Gen 1 Connectors

CN Label: **LAN_USB1**

CN Type: RJ-45 and USB Type-A connector

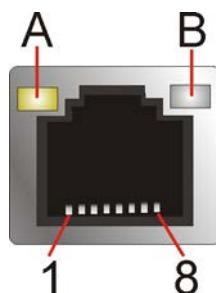
CN Location: See **Figure 3-33**

CN Pinouts: See **Table 3-32** and **Table 3-34**

The LAN connector connects to a local network.

eKINO-BT Mini-ITX SBC

Pin	Description	Pin	Description
1	MD0+	2	MD0-
3	MD1+	4	MD1-
5	MD2+	6	MD2-
7	MD3+	8	MD3-
9	VCC	10	GND
11	LINK_ACT+	12	LINK_ACT-
13	100-	14	1000-
15	GND		

Table 3-32: LAN Pinouts**Figure 3-37: Ethernet Connector**

LED	Description	LED	Description
A	on: linked blinking: data is being sent/received	B	off: 10 Mb/s green: 100 Mb/s orange: 1000 Mb/s

Table 3-33: Ethernet Connector LEDs

The eKINO-BT has two external USB 3.2 Gen 1 ports.

Pin	Description
1	VBUS
2	D1-
3	D1+
4	GND1
5	STDA_SS RX1_N
6	STDA_SS RX1_P
7	GND_DRAIN

Pin	Description
8	STDA_SSTX1_N
9	STDA_SSTX1_P

Table 3-34: External USB 3.2 Gen 1 Port Pinouts

3.3.5 Serial Port Connectors

CN Label: COM1, COM2, COM3

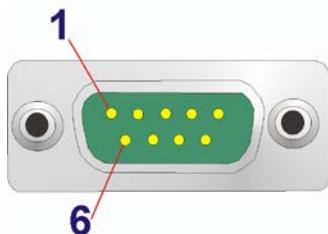
CN Type: DB-9

CN Location: See **Figure 3-33**

CN Pinouts: See **Table 3-35** and **Figure 3-38**

Each of the serial port connects to a RS-232 serial communication device.

Pin	Description	Pin	Description
1	DATA CARRIER DETECT (DCD1)	6	DATA SET READY (DSR1)
2	RECEIVE DATA (RXD1)	7	REQUEST TO SEND (RTS1)
3	TRANSMIT DATA (TXD1)	8	CLEAR TO SEND (CTS1)
4	DATA TERMINAL READY (DTR1)	9	RING INDICATOR (RI1)
5	GND		

Table 3-35: Serial Port Pinouts**Figure 3-38: Serial Port Pinouts**

3.3.6 VGA Connector

CN Label: VGA1

CN Type: 15-pin female

CN Location: See **Figure 3-33**

CN Pinouts: See **Table 3-36** and **Figure 3-39**

The VGA connector connects to a monitor that accepts a standard VGA input.

Pin	Description	Pin	Description
1	RED	2	GREEN
3	BLUE	4	NC
5	GND	6	GND
7	GND	8	GND
9	VGAVCC	10	GND
11	NC	12	DDCDAT
13	H SYNC	14	V SYNC
15	DDCCLK		

Table 3-36: VGA Connector Pinouts

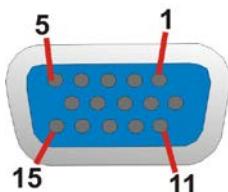


Figure 3-39: VGA Connector

**NOTE:**

After installing Intel® graphics driver, the two LVDS ports will be set to the primary display output ports and the VGA port will be disabled. The reason for this is the eKINO-BT uses two CH7511B chips to convert DP to LVDS and Intel® graphics driver recognizes the chips and the two LVDS ports as two devices. In addition, the on-board processor only supports dual display output, therefore, the display devices can only be connected to the two LVDS ports, not the VGA port.

If there is a need to change the display output port or set to VGA port only, please contact IEI for BIOS customization.

Chapter

4

Installation

4.1 Anti-static Precautions



WARNING:

Failure to take ESD precautions during installation may result in permanent damage to the product and severe injury to the user.

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the eKINO-BT. Dry climates are especially susceptible to ESD. It is therefore critical to strictly adhere to the following anti-static precautions whenever the eKINO-BT, or any other electrical component, is handled.

- ***Wear an anti-static wristband:*** - Wearing a simple anti-static wristband can help to prevent ESD from damaging the board.
- ***Self-grounding:*** - Before handling the board touch any grounded conducting material. During the time the board is handled, frequently touch any conducting materials that are connected to the ground.
- ***Use an anti-static pad:*** When configuring the eKINO-BT, place it on an anti-static pad. This reduces the possibility of ESD damaging the eKINO-BT.
- ***Only handle the edges of the PCB:*** - When handling the PCB, hold it by the edges.

4.2 Installation Considerations



NOTE:

The following installation notices and installation considerations should be read and understood before the eKINO-BT is installed. All installation notices pertaining to the installation of eKINO-BT should be strictly adhered to. Failing to adhere to these precautions may lead to severe damage of the eKINO-BT and injury to the person installing the motherboard.

**WARNING:**

The installation instructions described in this manual should be carefully followed in order to prevent damage to the eKINO-BT, eKINO-BT components and injury to the user.

Before and during the installation please **DO** the following:

- **Read the user manual:**
 - The user manual provides a complete description of the installation instructions and configuration options.
- **Wear an electrostatic discharge cuff (ESD):**
 - Electronic components are easily damaged by ESD. Wearing an ESD cuff removes ESD from the body and helps prevent ESD damage.
- **Place on an anti-static pad:**
 - When installing or configuring the motherboard, place it on an anti-static pad. This helps to prevent potential ESD damage.
- **Turn all power off:**
 - Make sure the product is disconnected from all power supplies and that no electricity is being fed into the system.

Before and during the installation of the eKINO-BT, **DO NOT**:

- Remove any of the stickers on the PCB board. These stickers are required for warranty validation.
- Use the product before verifying all the cables and power connectors are properly connected.
- Allow screws to come in contact with the PCB circuit, connector pins, or its components.

4.3 SO-DIMM Installation

To install a SO-DIMM, please follow the steps below and refer to **Figure 4-1**.



NOTE:

Use **DIMM1** slot when installing one SO-DIMM. For the SO-DIMM slot location, refer to **Figure 3-28**.

For dual channel configuration, always install two identical memory modules that feature the same capacity, timings, voltage, number of ranks and the same brand.

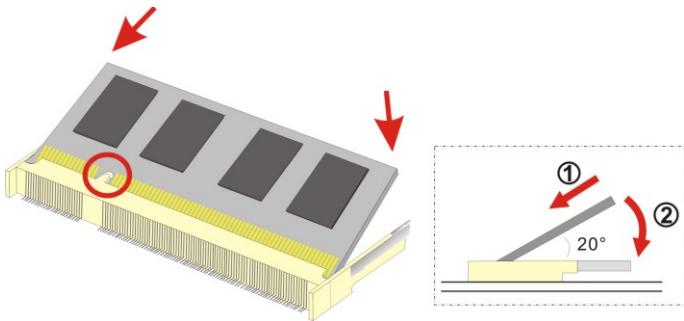


Figure 4-1: SO-DIMM Installation

Step 1: Locate the SO-DIMM socket on the solder side of the eKINO-BT. Place the board on an anti-static mat.

Step 2: Align the SO-DIMM with the socket. Align the notch on the memory with the notch on the memory socket.

Step 3: Insert the SO-DIMM. Push the memory in at a 20° angle. (See **Figure 4-1**)

Step 4: Seat the SO-DIMM. Gently push downwards and the arms clip into place. (See **Figure 4-1**)

4.4 Full-size PCIe Mini Card Installation

The PCIe Mini card slot allows installation of either a full-size or half-size PCIe Mini card.

To install a full-size PCIe Mini card, please follow the steps below.

Step 1: Locate the PCIe Mini card slot. See **Figure 3-20**.

Step 2: Remove the retention screws. Remove the two retention screws as shown in **Figure 4-2**.

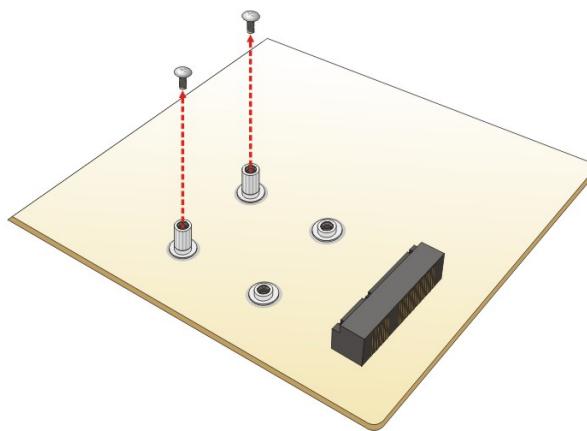


Figure 4-2: Removing the Retention Screws

Step 3: Insert into the socket at an angle. Line up the notch on the card with the notch on the slot. Slide the PCIe Mini card into the socket at an angle of about 20° (**Figure 4-3**).

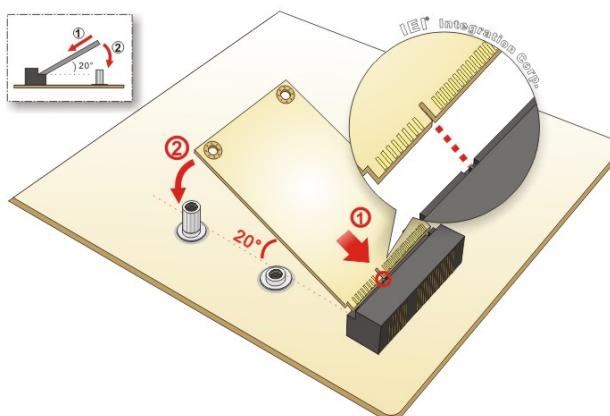


Figure 4-3: Inserting the Full-size PCIe Mini Card into the Slot at an Angle

Step 4: Secure the full-size PCIe Mini card. Secure the full-size PCIe Mini card with the retention screws previously removed (**Figure 4-4**).

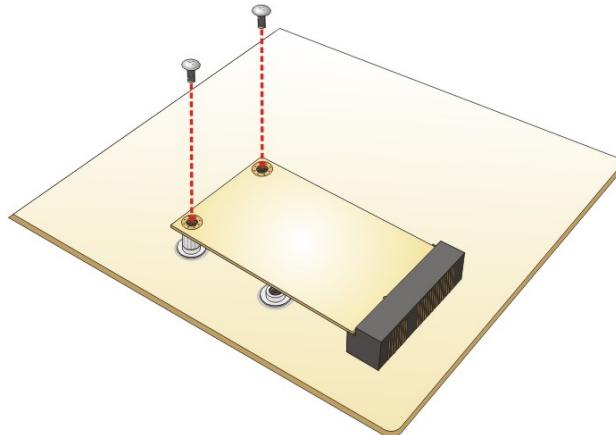


Figure 4-4: Securing the Full-size PCIe Mini Card

4.5 Half-size PCIe Mini Card Installation

The PCIe Mini card slot allows installation of either a full-size or half-size PCIe Mini card. To install a half-size PCIe Mini card, please follow the steps below.

Step 1: Locate the PCIe Mini card slot. See **Figure 3-20**.

Step 2: Remove the retention screw. Remove the retention screw as shown in **Figure 4-5**.

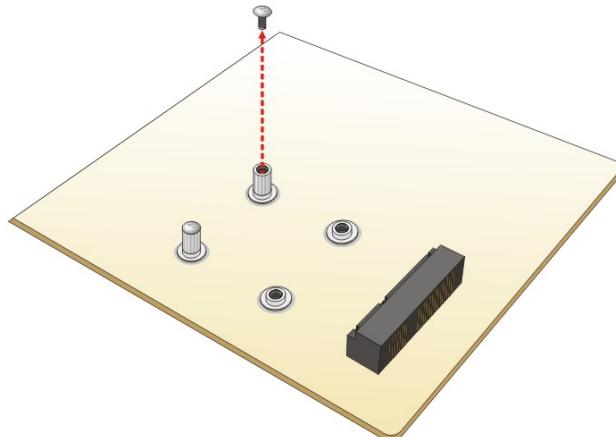


Figure 4-5: Removing the Retention Screw

eKINO-BT Mini-ITX SBC

Step 3: Remove the standoff. Unscrew and remove the standoff secured on the motherboard as shown in **Figure 4-6**.

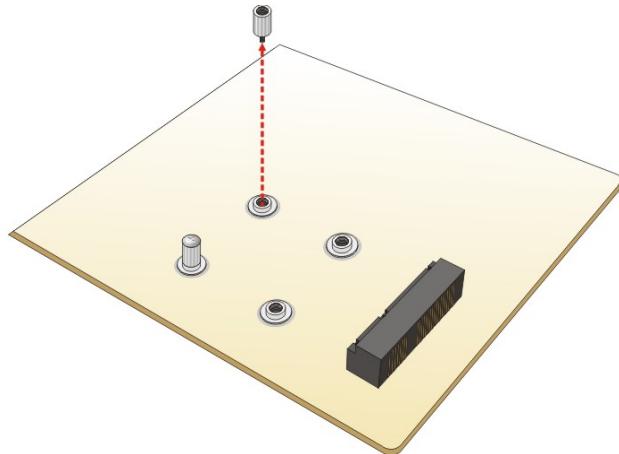


Figure 4-6: Removing the Standoff

Step 4: Install the standoff to the screw hole for the half-size PCIe Mini card. Install the previously removed standoff to the screw hole for the half-size PCIe Mini card (**Figure 4-7**).

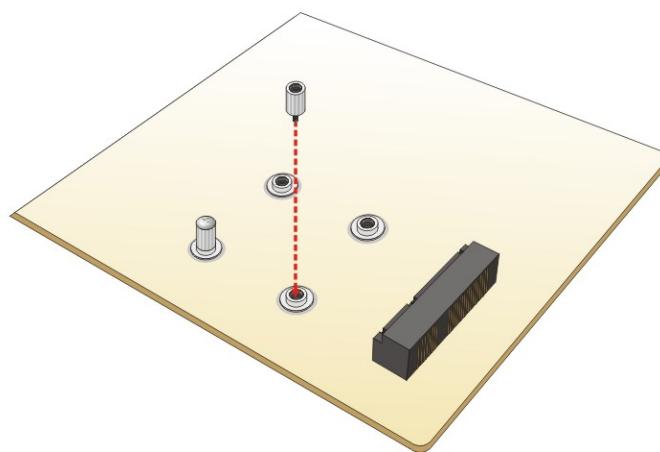


Figure 4-7: Installing the Standoff

Step 5: Insert into the socket at an angle. Line up the notch on the card with the notch on the slot. Slide the PCIe Mini card into the slot at an angle of about 20° (**Figure 4-8**).

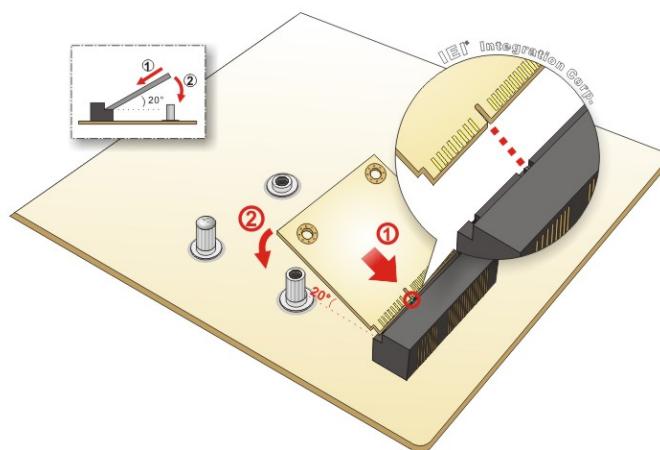


Figure 4-8: Inserting the Half-size PCIe Mini Card into the Slot at an Angle

Step 6: Secure the half-size PCIe Mini card. Secure the half-size PCIe Mini card with the retention screw previously removed (**Figure 4-9**).

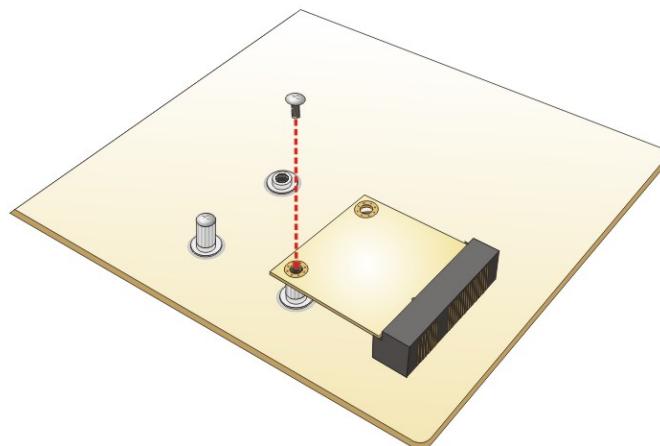


Figure 4-9: Securing the Half-size PCIe Mini Card

4.6 UPS Installation

To install the UPS, connect the AUPS battery to the motherboard and connect the motherboard to the 9 V ~ 26 V power supply.



NOTE:

A battery icon will be shown on the Windows notification area when the AUPS battery is installed to the system.

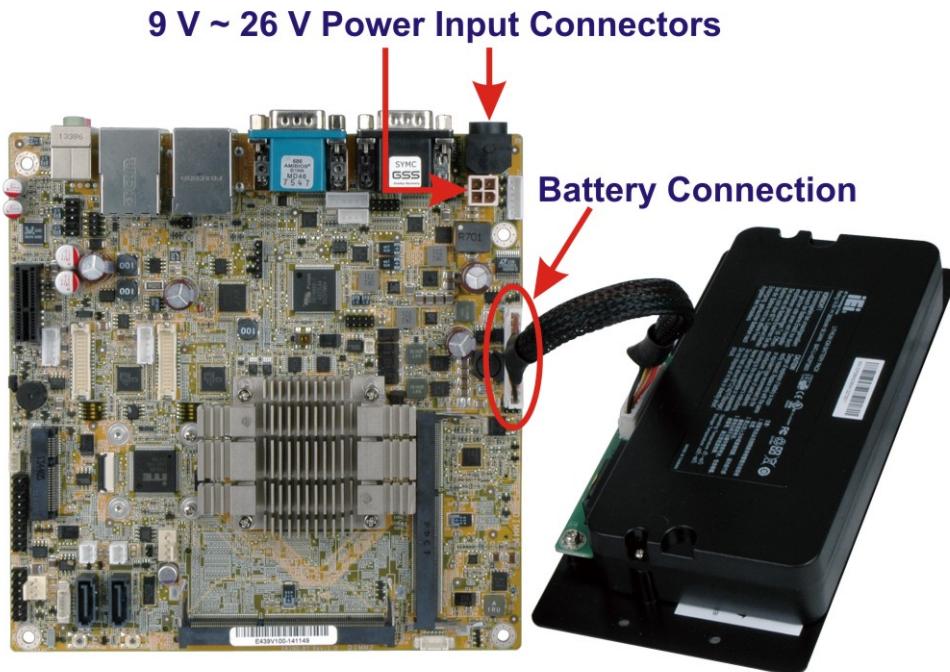


Figure 4-10: UPS Installation

4.7 System Configuration

The system configuration is controlled by buttons/jumpers/switches, and should be performed before installation.

4.7.1 AT/ATX Power Mode Selection

The AT and ATX power mode selection is made through the AT/ATX power mode switch which is shown in **Figure 4-11**.

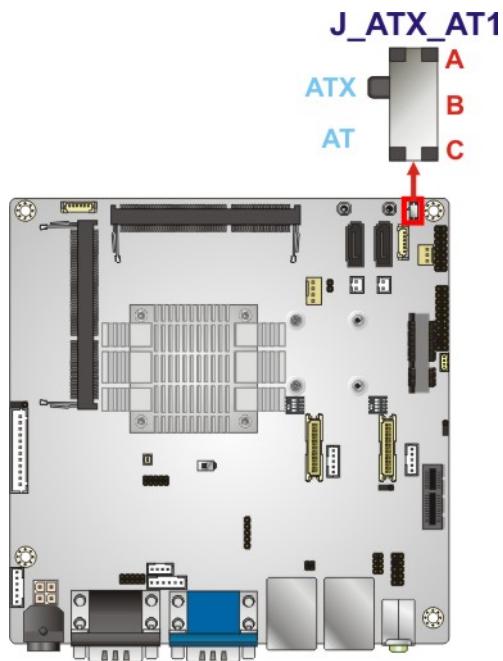


Figure 4-11: AT/ATX Power Mode Switch Location

Setting	Description
A-B	ATX power mode (default)
B-C	AT power mode

Table 4-1: AT/ATX Power Mode Switch Settings

4.7.2 Battery Enable/Disable

- Jumper Label:** JP3
Jumper Type: 2-pin header
Jumper Settings: See **Table 4-6**
Jumper Location: See **Figure 4-17**

When this jumper is closed, the system will use the battery when needed; when open, the system will not use the battery.

Setting	Description
Closed	Enable battery (Default)
Open	Disable battery

Table 4-2: Battery Enable/Disable Jumper Settings

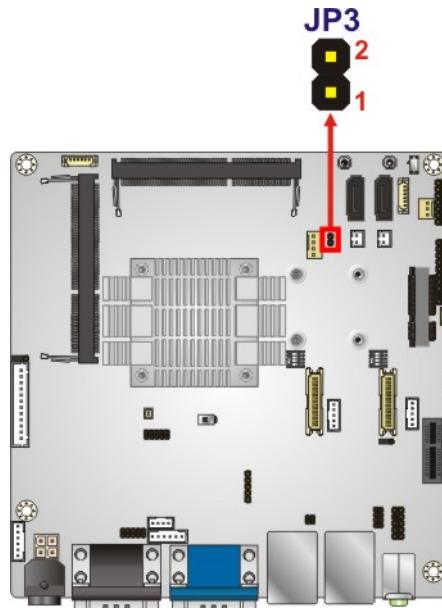


Figure 4-12: Battery Enable/Disable Jumper Location

4.7.3 Clear CMOS Button

To reset the BIOS, remove the on-board battery and press the clear CMOS button for three seconds or more. The clear CMOS button location is shown in **Figure 4-13**.

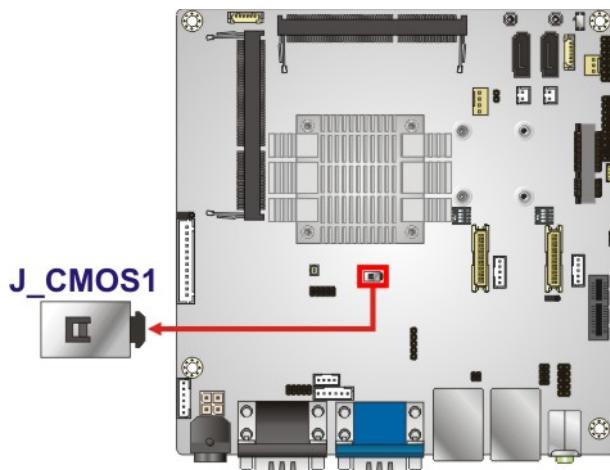


Figure 4-13: Clear CMOS Button Location

4.7.4 LVDS Panel Type Selection

Jumper Label: SW1, SW2

Jumper Type: DIP switch

Jumper Settings: See **Table 4-3**

Jumper Location: See **Figure 4-14**

Use the DIP switches to select the resolution of the LCD panel connected to the LVDS1 and LVDS2 connectors.



NOTE:

The **SW1** and **SW2** DIP switches must be set to the same settings.

eKINO-BT Mini-ITX SBC

* ON=0, OFF=1; Single=S, Dual=D

SW1 (4-3-2-1)	Description
0000	800x600 18-bit S (default)
0001	1024x768 18-bit S
0010	1024x768 24-bit S
0011	1280x768 18-bit S
0100	1280x800 18-bit S
0101	1280x960 18-bit S
0110	1280x1024 24-bit D
0111	1366x768 18-bit S
1000	1366x768 24-bit S
1001	1440x960 24-bit D
1010	1400x1050 24-bit D
1011	1600x900 24-bit D
1100	1680x1050 24-bit D
1101	1600x1200 24-bit D
1110	1920x1080 24-bit D
1111	1920x1200 24-bit D

Table 4-3: LVDS Panel Type Selection

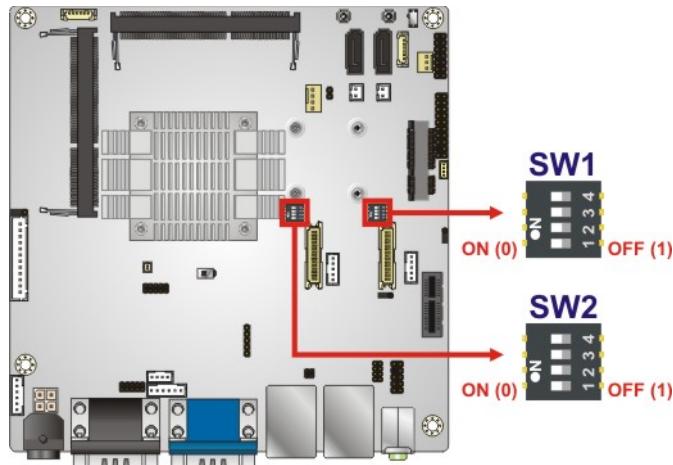


Figure 4-14: LVDS Panel Type Selection Switch Locations

4.7.5 LVDS1 Voltage Selection

**WARNING:**

Permanent damage to the screen and eKINO-BT may occur if the wrong voltage is selected with this jumper. Please refer to the user guide that came with the monitor to select the correct voltage.

Jumper Label: JP1

Jumper Type: 3-pin header

Jumper Settings: See Table 4-4

Jumper Location: See Figure 4-15

The LVDS1 voltage selection jumper allows setting the voltage provided to the monitor connected to the LVDS1 connector.

Setting	Description
Short 1-2	+3.3V LVDS (Default)
Short 2-3	+5V LVDS

Table 4-4: LVDS1 Voltage Selection Jumper Settings

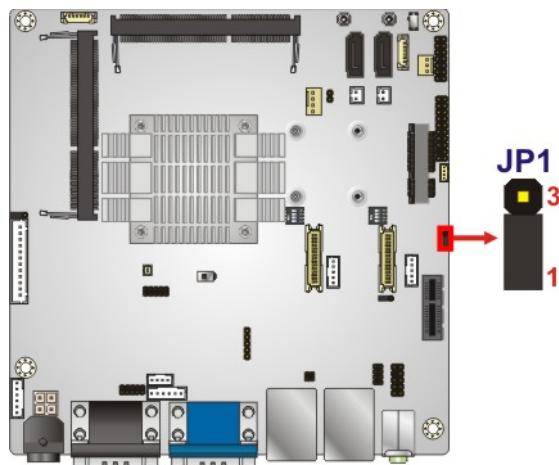


Figure 4-15: LVDS1 Voltage Selection Jumper Location

4.7.6 LVDS2 Voltage Selection

**WARNING:**

Permanent damage to the screen and eKINO-BT may occur if the wrong voltage is selected with this jumper. Please refer to the user guide that came with the monitor to select the correct voltage.

Jumper Label: JP2

Jumper Type: 3-pin header

Jumper Settings: See Table 4-5

Jumper Location: See Figure 4-16

The LVDS2 voltage selection jumper allows setting the voltage provided to the monitor connected to the LVDS2 connector.

Setting	Description
Short 1-2	+3.3V LVDS (Default)
Short 2-3	+5V LVDS

Table 4-5: LVDS2 Voltage Selection Jumper Settings

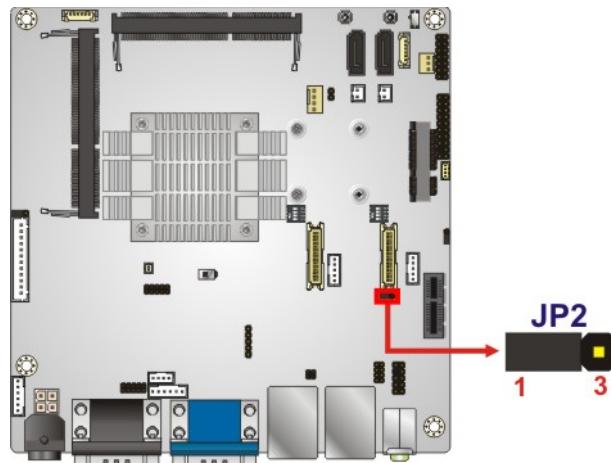


Figure 4-16: LVDS2 Voltage Selection Jumper Location

4.7.7 UPS/Battery Mode Selection

Jumper Label: J_UPS1

Jumper Type: 3-pin header

Jumper Settings: See Table 4-6

Jumper Location: See Figure 4-17

This jumper sets the system to run off the battery exclusively, or to use the battery as a UPS.

Setting	Description
Short 1-2	UPS mode (Default)
Short 2-3	Battery mode

Table 4-6: UPS/Battery Mode Selection Jumper Settings

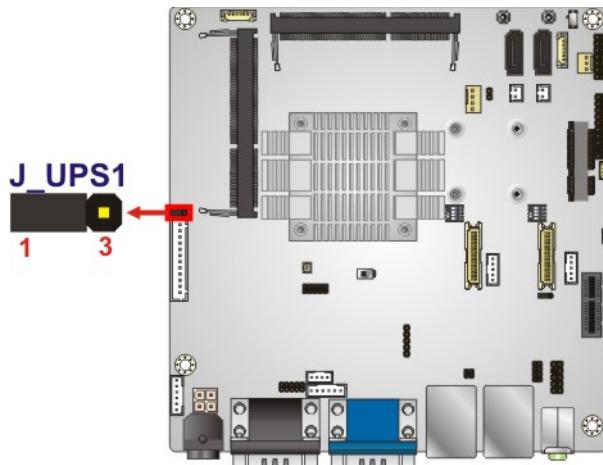


Figure 4-17: UPS/Battery Mode Selection Jumper Location

eKINO-BT Mini-ITX SBC

The power behavior of the UPS and battery modes might be different in the AT and ATX power modes. Refer to **Table 4-7** and **Table 4-8** for differences.

	Power Supply	UPS Mode	Battery Mode
Powering On	Battery only	The system can't be powered on.	The system powers on automatically.
	External DC only	The system powers on automatically.	
	Battery + External DC		
Powering Off	Battery only	N/A	
	External DC only	The system powers off automatically.	
	Battery + External DC		
DC Power Failure	Battery only	N/A	
	External DC only	The system powers off automatically.	
	Battery + External DC	The system is on until the battery is run out.	

Table 4-7: In AT Power Mode

	Power Supply	UPS Mode	Battery Mode
Powering On	Battery only	The system can't be powered on by pressing the power button.	Press the power button to power on the system.
	External DC only	Press the power button to power on the system.	
	Battery + External DC		
Powering Off	Battery only	Power off the system from OS or by pressing the power button. The system is powered off when the battery is run out.	
	External DC only	Power off the system from OS or by pressing the power button.	
	Battery + External DC		
DC Power Failure	Battery only	The system is on until the battery is run out.	
	External DC only	The system powers off automatically.	
	Battery + External DC	The system is on until the battery is run out.	

Table 4-8: In ATX Power Mode

4.8 Chassis Installation

4.8.1 Airflow



WARNING:

Airflow is critical for keeping components within recommended operating temperatures. The chassis should have fans and vents as necessary to keep things cool.

The eKINO-BT must be installed in a chassis with ventilation holes on the sides allowing airflow to travel through the heat sink surface. In a system with an individual power supply unit, the cooling fan of a power supply can also help generate airflow through the board surface.

4.8.2 Motherboard Installation

To install the eKINO-BT motherboard into the chassis please refer to the reference material that came with the chassis.

4.9 Internal Peripheral Device Connections

This section outlines the installation of peripheral devices to the onboard connectors.

4.9.1 SATA Drive Connection

The eKINO-BT is shipped with two SATA drive cables. To connect the SATA drive to the connector, please follow the steps below.

Step 1: Locate the SATA connector and the SATA power connector. The locations of the connectors are shown in **Chapter 3**.

Step 2: Insert the cable connector. Insert the cable connector into the on-board SATA drive connector and the SATA power connector. See **Figure 4-18**.

eKINO-BT Mini-ITX SBC

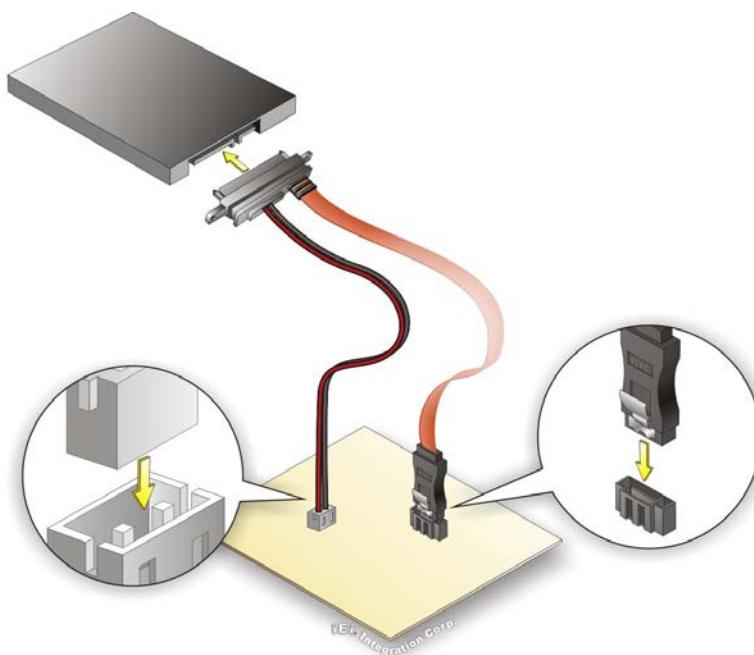


Figure 4-18: SATA Drive Cable Connection

Step 3: **Connect the cable to the SATA disk.** Connect the connector on the other end of the cable to the connector at the back of the SATA drive. See **Figure 4-18**.

Step 4: To remove the SATA cable from the SATA connector, press the clip on the connector at the end of the cable.

Chapter

5

BIOS

5.1 Introduction

The BIOS is programmed onto the BIOS chip. The BIOS setup program allows changes to certain system settings. This chapter outlines the options that can be changed.



NOTE:

Some of the BIOS options may vary throughout the life cycle of the product and are subject to change without prior notice.

5.1.1 Starting Setup

The UEFI BIOS is activated when the computer is turned on. The setup program can be activated in one of two ways.

1. Press the **DEL** or **F2** key as soon as the system is turned on or
2. Press the **DEL** or **F2** key when the “**Press DEL or F2 to enter SETUP**” message appears on the screen.

If the message disappears before the **DEL** or **F2** key is pressed, restart the computer and try again.

5.1.2 Using Setup

Use the arrow keys to highlight items, press **ENTER** to select, use the **PageUp** and **PageDown** keys to change entries, press **F1** for help and press **Esc** to quit. Navigation keys are shown in the following table.

Key	Function
Up arrow	Move to previous item
Down arrow	Move to next item
Left arrow	Move to the item on the left hand side
Right arrow	Move to the item on the right hand side
+	Increase the numeric value or make changes
-	Decrease the numeric value or make changes

Key	Function
Page Up key	Move to the next page
Page Dn key	Move to the previous page
Esc key	Main Menu – Quit and not save changes into CMOS Status Page Setup Menu and Option Page Setup Menu -- Exit current page and return to Main Menu
F1	General help, only for Status Page Setup Menu and Option Page Setup Menu
F2	Load previous values
F3	Load optimized defaults
F4	Save changes and Exit BIOS

Table 5-1: BIOS Navigation Keys

5.1.3 Getting Help

When **F1** is pressed a small help window describing the appropriate keys to use and the possible selections for the highlighted item appears. To exit the Help Window press **Esc** or the **F1** key again.

5.1.4 Unable to Reboot after Configuration Changes

If the computer cannot boot after changes to the system configuration are made, CMOS defaults. Use the clear CMOS button described in [Chapter 4](#).

5.1.5 BIOS Menu Bar

The **menu bar** on top of the BIOS screen has the following main items:

- Main – Changes the basic system configuration.
- Advanced – Changes the advanced system settings.
- Chipset – Changes the chipset settings.
- Security – Sets User and Supervisor Passwords.
- Boot – Changes the system boot configuration.
- Save & Exit – Selects exit options and loads default settings.

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The following sections completely describe the configuration options found in the menu items at the top of the BIOS screen and listed above.

5.2 Main

The **Main** BIOS menu (**BIOS Menu 1**) appears when the **BIOS Setup** program is entered.

The **Main** menu gives an overview of the basic system information.

Aptio Setup Utility - Copyright (C) 2013 American Megatrends, Inc.					
Main	Advanced	Chipset	Security	Boot	Save & Exit
BIOS Information					Set the Date. Use Tab to switch between Date elements.
BIOS Vendor	American Megatrends				
Core Version	5.009				
Compliance	UEFI 2.3; PI 1.2				
Project Version	E439AI10.ROM				
Build Date and Time	04/30/2014 11:43:32				
iWDD Vendor	iEi				
iWDD Version	E439ER10.bin				
CPU Configuration					-----
Microcode Patch	321				
BayTrail SoC	B3 Stepping				
Memory Information					→←: Select Screen
Total Memory	4096 MB (LPDDR3)				↑↓: Select Item
G0P Information					Enter: Select
Intel(R) G0P Driver	[N/A]				+/-: Change Opt.
TXE Information					F1: General Help
Sec RC Version	00.05.00.00				F2: Previous Values
TXE FW Version	01.00.02.1060				F3: Optimized Defaults
System Date	[Tue 07/22/2014]				F4: Save & Exit
System Time	[15:10:27]				ESC: Exit
Access Level	Administrator				
Version 2.16.1242. Copyright (C) 2013 American Megatrends, Inc.					

BIOS Menu 1: Main

The Main menu has two user configurable fields:

➔ System Date [xx/xx/xx]

Use the **System Date** option to set the system date. Manually enter the day, month and year.

➔ System Time [xx:xx:xx]

Use the **System Time** option to set the system time. Manually enter the hours, minutes and seconds.

5.3 Advanced

Use the **Advanced** menu (**BIOS Menu 2**) to configure the CPU and peripheral devices through the following sub-menus:

**WARNING:**

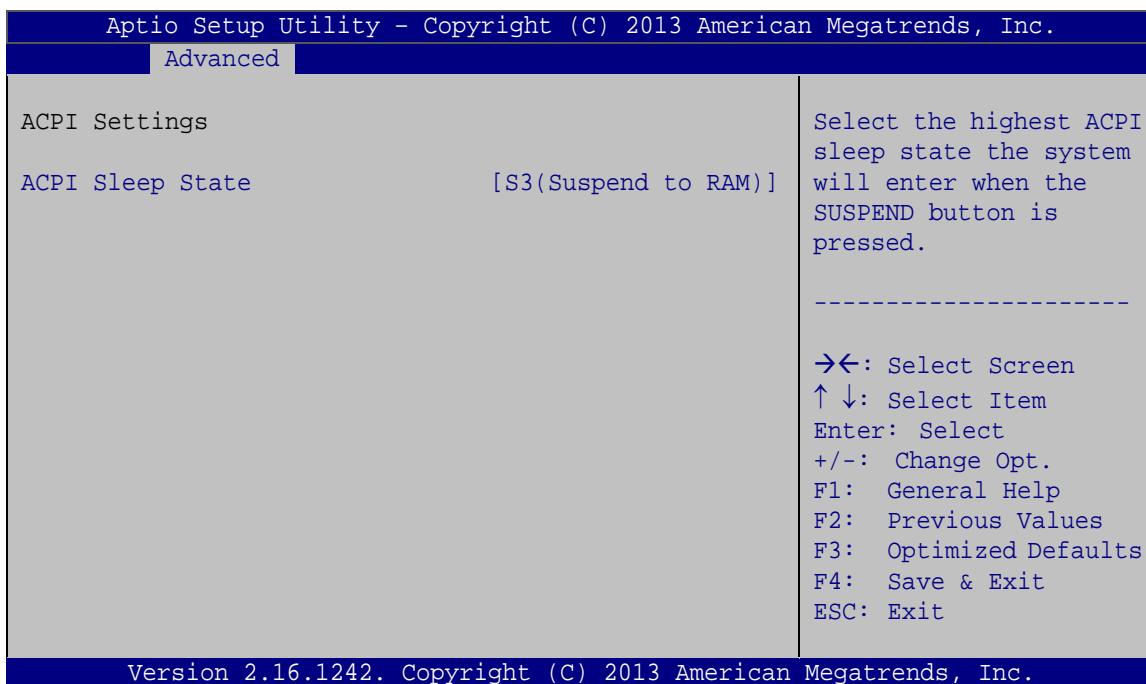
Setting the wrong values in the sections below may cause the system to malfunction. Make sure that the settings made are compatible with the hardware.

Aptio Setup Utility - Copyright (C) 2013 American Megatrends, Inc.	
Main	Advanced
> ACPI Settings > F81866 Super IO Configuration > iWDD H/W Monitor > RTC Wake Settings > Serial Port Console Redirection > CPU Configuration > IDE Configuration > Trusted Computing > USB Configuration	System ACPI Parameters ----- →←: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version 2.16.1242. Copyright (C) 2013 American Megatrends, Inc.	

BIOS Menu 2: Advanced

5.3.1 ACPI Settings

The **ACPI Settings** menu (**BIOS Menu 3**) configures the Advanced Configuration and Power Interface (ACPI) options.



BIOS Menu 3: ACPI Settings

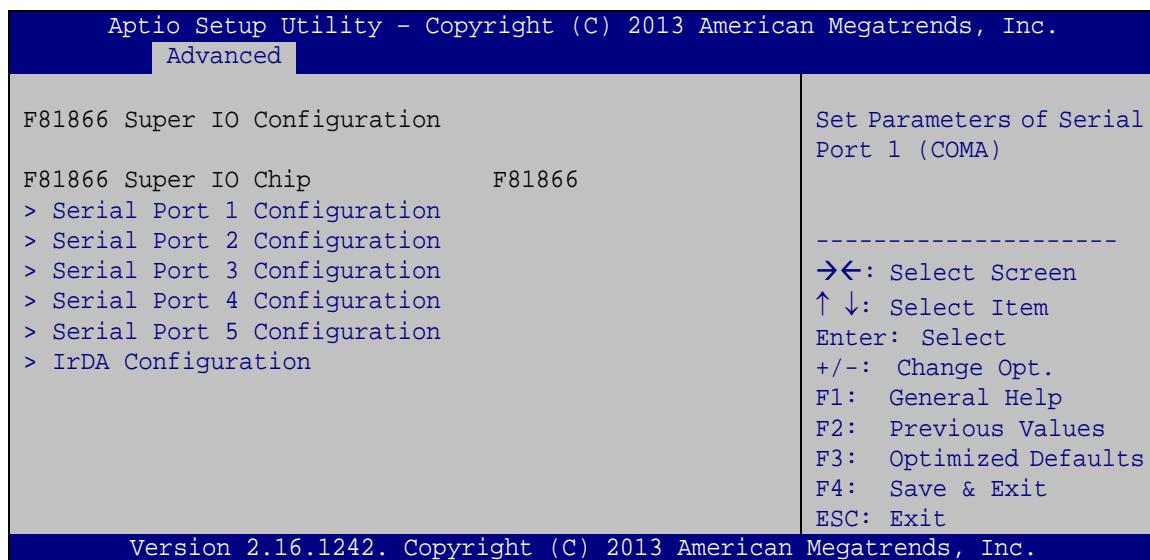
➔ **ACPI Sleep State [S3 (Suspend to RAM)]**

Use the **ACPI Sleep State** option to specify the sleep state the system enters when it is not being used.

- ➔ **S3 (Suspend to DEFAULT RAM)** The caches are flushed and the CPU is powered off. Power to the RAM is maintained. The computer returns slower to a working state, but more power is saved.

5.3.2 F81866 Super IO Configuration

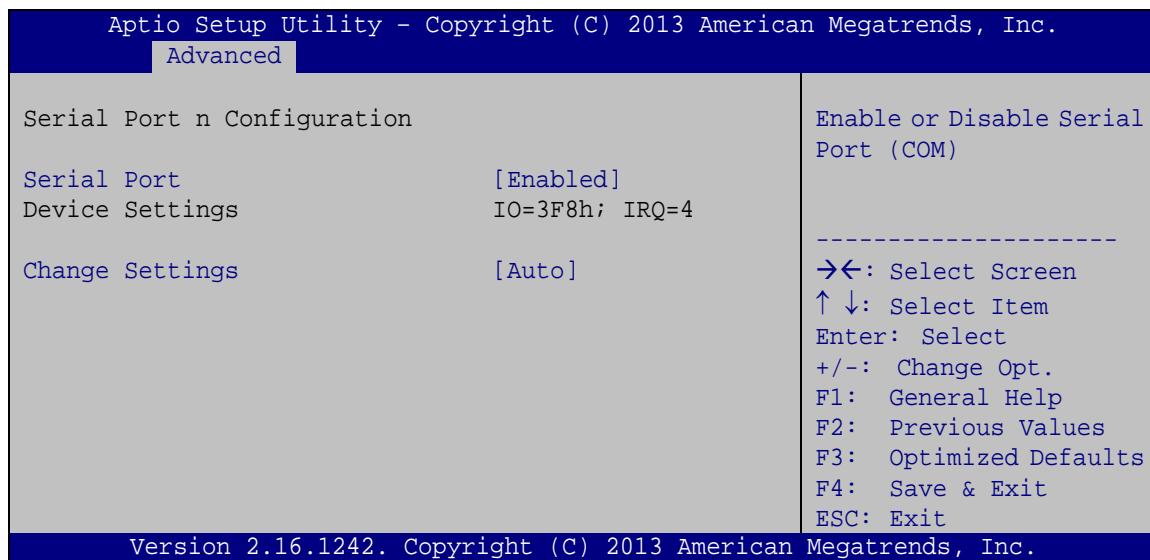
Use the **F81866 Super IO Configuration** menu (**BIOS Menu 4**) to set or change the configurations for the serial ports.



BIOS Menu 4: F81866 Super IO Configuration

5.3.2.1 Serial Port n Configuration

Use the **Serial Port n Configuration** menu (**BIOS Menu 5**) to configure the serial port n.



BIOS Menu 5: Serial Port n Configuration Menu

5.3.2.1.1 Serial Port 1 Configuration

➔ Serial Port [Enabled]

Use the **Serial Port** option to enable or disable the serial port.

➔ **Disabled** Disable the serial port

➔ **Enabled** **DEFAULT** Enable the serial port

➔ Change Settings [Auto]

Use the **Change Settings** option to change the serial port IO port address and interrupt address.

➔ **Auto** **DEFAULT** The serial port IO port address and interrupt address are automatically detected.

➔ **IO=3F8h;** Serial Port I/O port address is 3F8h and the interrupt address is IRQ4

➔ **IO=3F8h;** Serial Port I/O port address is 3F8h and the interrupt address is IRQ3, 4

➔ **IO=2F8h;** Serial Port I/O port address is 2F8h and the interrupt address is IRQ3, 4

➔ **IO=3E8h;** Serial Port I/O port address is 3E8h and the interrupt address is IRQ3, 4

➔ **IO=2E8h;** Serial Port I/O port address is 2E8h and the interrupt address is IRQ3, 4

5.3.2.1.2 Serial Port 2 Configuration

➔ Serial Port [Enabled]

Use the **Serial Port** option to enable or disable the serial port.

➔ **Disabled** Disable the serial port

➔ **Enabled** **DEFAULT** Enable the serial port

➔ **Change Settings [Auto]**

Use the **Change Settings** option to change the serial port IO port address and interrupt address.

- | | | |
|--------------------------------|----------------|---|
| ➔ Auto | DEFAULT | The serial port IO port address and interrupt address are automatically detected. |
| ➔ IO=2F8h;
IRQ=3 | | Serial Port I/O port address is 2F8h and the interrupt address is IRQ3 |
| ➔ IO=3F8h;
IRQ=3, 4 | | Serial Port I/O port address is 3F8h and the interrupt address is IRQ3, 4 |
| ➔ IO=2F8h;
IRQ=3, 4 | | Serial Port I/O port address is 2F8h and the interrupt address is IRQ3, 4 |
| ➔ IO=3E8h;
IRQ=3, 4 | | Serial Port I/O port address is 3E8h and the interrupt address is IRQ3, 4 |
| ➔ IO=2E8h;
IRQ=3, 4 | | Serial Port I/O port address is 2E8h and the interrupt address is IRQ3, 4 |

5.3.2.1.3 Serial Port 3 Configuration

➔ **Serial Port [Enabled]**

Use the **Serial Port** option to enable or disable the serial port.

- | | |
|-------------------|---------------------------------------|
| ➔ Disabled | Disable the serial port |
| ➔ Enabled | DEFAULT Enable the serial port |

➔ **Change Settings [Auto]**

Use the **Change Settings** option to change the serial port IO port address and interrupt address.

- | | | |
|---------------|----------------|---|
| ➔ Auto | DEFAULT | The serial port IO port address and interrupt address are automatically detected. |
|---------------|----------------|---|

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- ➔ **IO=3E8h;
IRQ=10** Serial Port I/O port address is 3E8h and the interrupt address is IRQ10
- ➔ **IO=3F8h;
IRQ=10, 11** Serial Port I/O port address is 3F8h and the interrupt address is IRQ10, 11
- ➔ **IO=2F8h;
IRQ=10, 11** Serial Port I/O port address is 2F8h and the interrupt address is IRQ10, 11
- ➔ **IO=3E8h;
IRQ=10, 11** Serial Port I/O port address is 3E8h and the interrupt address is IRQ10, 11
- ➔ **IO=2E8h;
IRQ=10, 11** Serial Port I/O port address is 2E8h and the interrupt address is IRQ10, 11
- ➔ **IO=2E0h;
IRQ=10, 11** Serial Port I/O port address is 2E0h and the interrupt address is IRQ10, 11

5.3.2.1.4 Serial Port 4 Configuration

➔ **Serial Port [Enabled]**

Use the **Serial Port** option to enable or disable the serial port.

- ➔ **Disabled** Disable the serial port
- ➔ **Enabled DEFAULT** Enable the serial port

➔ **Change Settings [Auto]**

Use the **Change Settings** option to change the serial port IO port address and interrupt address.

- ➔ **Auto DEFAULT** The serial port IO port address and interrupt address are automatically detected.
- ➔ **IO=2E8h;
IRQ=11** Serial Port I/O port address is 2E8h and the interrupt address is IRQ11
- ➔ **IO=3F8h;
IRQ=10, 11** Serial Port I/O port address is 3F8h and the interrupt address is IRQ10, 11

- ➔ IO=2F8h;
IRQ=10, 11 Serial Port I/O port address is 2F8h and the interrupt address is IRQ10, 11
- ➔ IO=3E8h;
IRQ=10, 11 Serial Port I/O port address is 3E8h and the interrupt address is IRQ10, 11
- ➔ IO=2E8h;
IRQ=10, 11 Serial Port I/O port address is 2E8h and the interrupt address is IRQ10, 11
- ➔ IO=2E0h;
IRQ=10, 11 Serial Port I/O port address is 2E0h and the interrupt address is IRQ10, 11

5.3.2.1.5 Serial Port 5 Configuration

➔ Serial Port [Enabled]

Use the **Serial Port** option to enable or disable the serial port.

- ➔ **Disabled** Disable the serial port
- ➔ **Enabled** **DEFAULT** Enable the serial port

➔ Change Settings [Auto]

Use the **Change Settings** option to change the serial port IO port address and interrupt address.

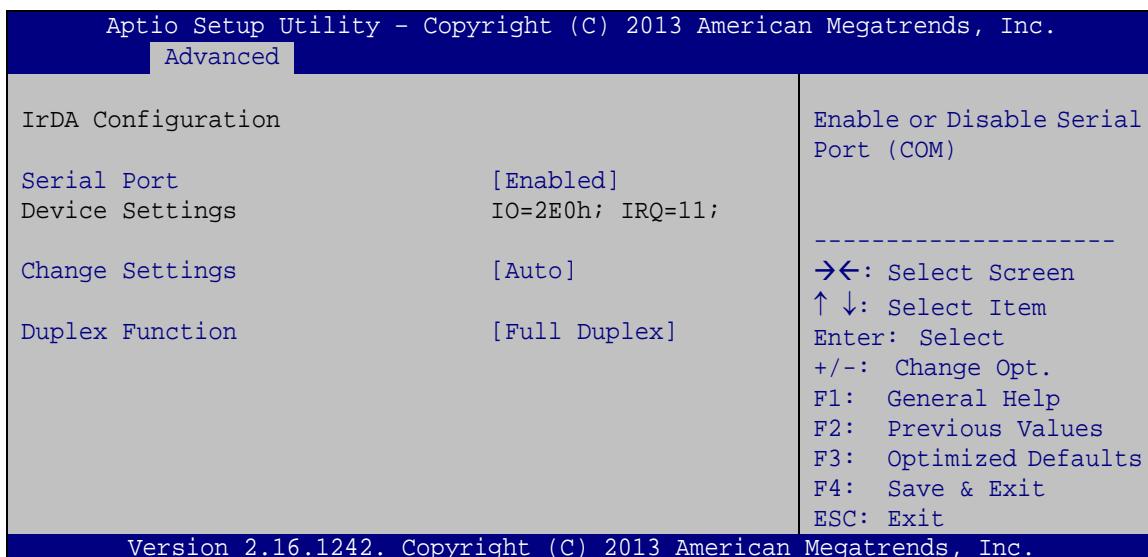
- ➔ **Auto** **DEFAULT** The serial port IO port address and interrupt address are automatically detected.
- ➔ IO=2D0h;
IRQ=10 Serial Port I/O port address is 2D0h and the interrupt address is IRQ10
- ➔ IO=3F8h;
IRQ=10, 11 Serial Port I/O port address is 3F8h and the interrupt address is IRQ10, 11
- ➔ IO=2F8h;
IRQ=10, 11 Serial Port I/O port address is 2F8h and the interrupt address is IRQ10, 11
- ➔ IO=3E8h;
IRQ=10, 11 Serial Port I/O port address is 3E8h and the interrupt address is IRQ10, 11

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- ➔ **IO=2E8h;
IRQ=10, 11** Serial Port I/O port address is 2E8h and the interrupt address is IRQ10, 11
- ➔ **IO=2D0h;
IRQ=10, 11** Serial Port I/O port address is 2D0h and the interrupt address is IRQ10, 11
- ➔ **IO=2E0h;
IRQ=10, 11** Serial Port I/O port address is 2E0h and the interrupt address is IRQ10, 11

5.3.2.1.6 IrDA Configuration

Use the **IrDA Configuration** menu (**BIOS Menu 6**) to configure the infrared port.



BIOS Menu 6: IrDA Configuration Menu

➔ **Serial Port [Enabled]**

Use the **Serial Port** option to enable or disable the IrDA function.

- ➔ **Disabled** Disable the IrDA function
- ➔ **Enabled DEFAULT** Enable the IrDA function

➔ **Change Settings [Auto]**

Use the **Change Settings** option to change the serial port IO address and interrupt address.

- ➔ **Auto** **DEFAULT** The serial port IO port address and interrupt address are automatically detected.
- ➔ **IO=2E0h;
IRQ=11** Serial Port I/O port address is 2E0h and the interrupt address is IRQ11
- ➔ **IO=3F8h;
IRQ=10, 11** Serial Port I/O port address is 3F8h and the interrupt address is IRQ10, 11
- ➔ **IO=2F8h;
IRQ=10, 11** Serial Port I/O port address is 2F8h and the interrupt address is IRQ10, 11
- ➔ **IO=3E8h;
IRQ=10, 11** Serial Port I/O port address is 3E8h and the interrupt address is IRQ10, 11
- ➔ **IO=2E8h;
IRQ=10, 11** Serial Port I/O port address is 2E8h and the interrupt address is IRQ10, 11
- ➔ **IO=2D0h;
IRQ=10, 11** Serial Port I/O port address is 2D0h and the interrupt address is IRQ10, 11
- ➔ **IO=2E0h;
IRQ=10, 11** Serial Port I/O port address is 2E0h and the interrupt address is IRQ10, 11

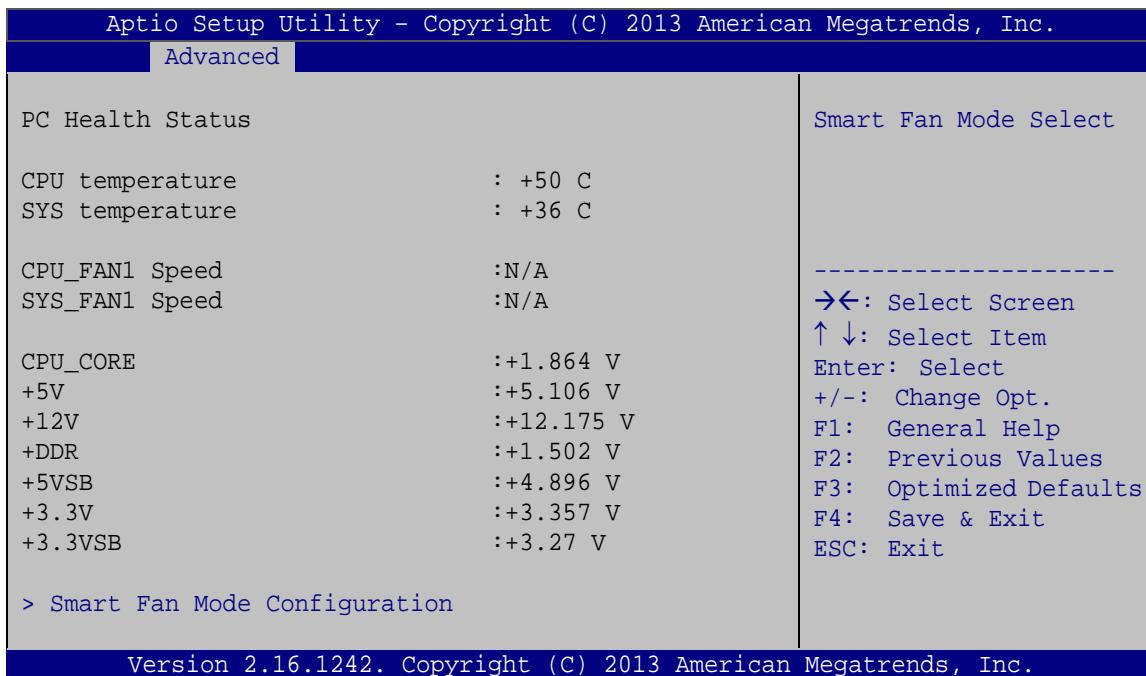
➔ **Duplex Function [Full Duplex]**

Use the **Duplex Function** option to select the IR data transmission mode.

- ➔ **Full
Duplex** **DEFAULT** The communication channels are used to send and receive the data in both directions at the same time.
- ➔ **Half
Duplex** Transmission signals are sent in both directions, but one direction at a time so half duplex lines can alternatively send and receive data.

eKINO-BT Mini-ITX SBC**5.3.3 iWDD H/W Monitor**

The **iWDD H/W Monitor** menu (**BIOS Menu 7**) displays the system temperatures and voltages.

**BIOS Menu 7: iWDD H/W Monitor**

➔ **PC Health Status**

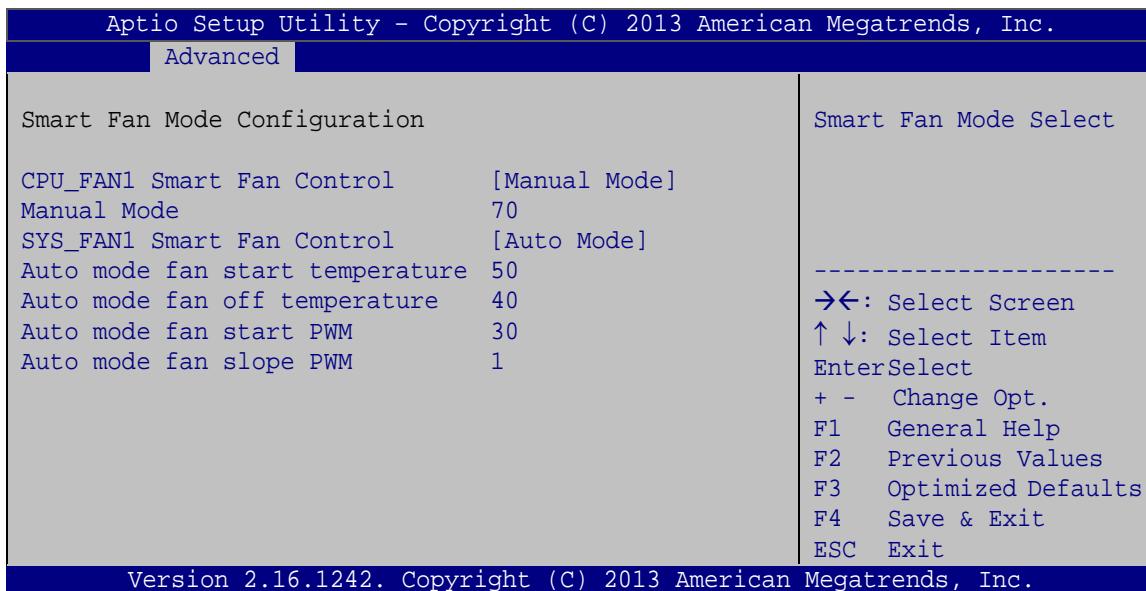
The following system parameters and values are shown. The system parameters that are monitored are:

- System Temperatures:
 - CPU Temperature
 - System Temperature
- Fan Speeds:
 - CPU Fan Speed
 - System Fan Speed
- Voltages:
 - CPU_CORE
 - +5V
 - +12V

- +DDR
- +5VSB
- +3.3V
- +3.3VSB

5.3.3.1 Smart Fan Mode Configuration

Use the **Smart Fan Mode Configuration** submenu (**BIOS Menu 8**) to configure smart fan temperature and speed settings.



BIOS Menu 8: Smart Fan Mode Configuration

➔ CPU_FAN1 Smart Fan Control [Manual Mode]

Use the **CPU_FAN1 Smart Fan Control** option to configure the CPU Smart Fan.

➔ **Manual Mode** **DEFAULT** The fan spins at the speed set in Manual Mode settings.

➔ SYS_FAN1 Smart Fan Control [Auto Mode]

Use the **SYS_FAN1 Smart Fan Control** option to configure the System Smart Fan.

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→ **Manual Mode** The fan spins at the speed set in Manual Mode settings.

→ **Auto Mode** **DEFAULT** The fan adjusts its speed using Auto Mode settings.

→ **Auto mode fan start/off temperature**

Use the + or – key to change the **Auto mode fan start/off temperature** value. Enter a decimal number between 1 and 100.

→ **Auto mode fan start PWM**

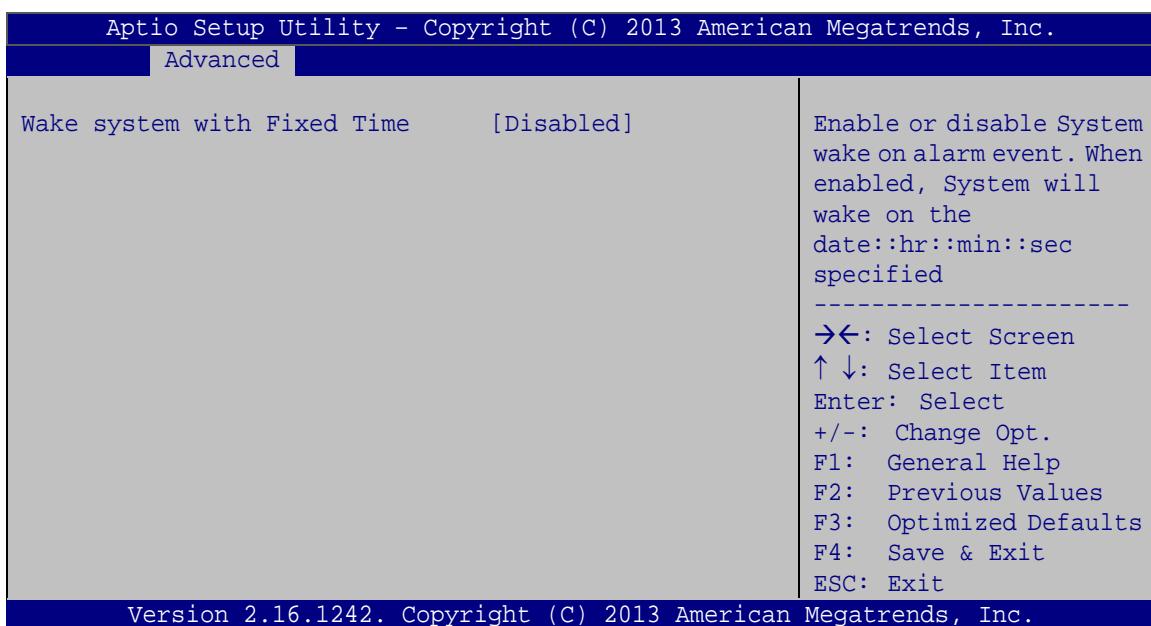
Use the + or – key to change the **Auto mode fan start PWM** value. Enter a decimal number between 1 and 100.

→ **Auto mode fan slope PWM**

Use the + or – key to change the **Auto mode fan slope PWM** value. Enter a decimal number between 1 and 64.

5.3.4 RTC Wake Settings

The **RTC Wake Settings** menu (**BIOS Menu 9**) enables the system to wake at the specified time.



BIOS Menu 9: RTC Wake Settings

→ Wake system with Fixed Time [Disabled]

Use the **Wake system with Fixed Time** option to enable or disable the system wake on alarm event.

→ **Disabled** **DEFAULT** The real time clock (RTC) cannot generate a wake event

→ **Enabled** If selected, the **Wake up every day** option appears allowing you to enable to disable the system to wake every day at the specified time. Besides, the following options appear with values that can be selected:

Wake up every day

Wake up date

Wake up hour

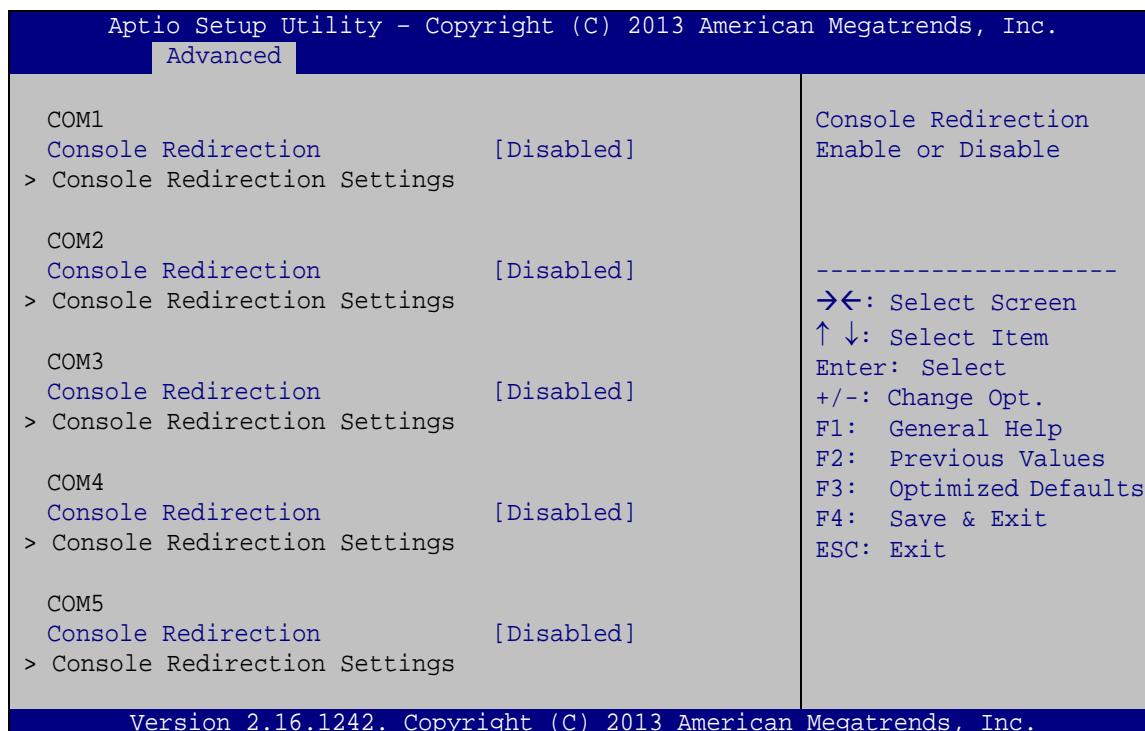
Wake up minute

Wake up second

After setting the alarm, the computer turns itself on from a suspend state when the alarm goes off.

5.3.5 Serial Port Console Redirection

The **Serial Port Console Redirection** menu (**BIOS Menu 10**) allows the console redirection options to be configured. Console redirection allows users to maintain a system remotely by re-directing keyboard input and text output through the serial port.



BIOS Menu 10: Serial Port Console Redirection

→ **Console Redirection [Disabled]**

Use **Console Redirection** option to enable or disable the console redirection function.

- | | | |
|-------------------|---------|---|
| → Disabled | DEFAULT | Disabled the console redirection function |
| → Enabled | | Enabled the console redirection function |



NOTE:

The following options are available in the **Console Redirection Settings** submenu when the **Console Redirection** option is enabled.

→ Terminal Type [ANSI]

Use the **Terminal Type** option to specify the remote terminal type.

- ➔ **VT100** The target terminal type is VT100
 - ➔ **VT100+** The target terminal type is VT100+
 - ➔ **VT-UTF8** The target terminal type is VT-UTF8
 - ➔ **ANSI** **DEFAULT** The target terminal type is ANSI

→ Bits per second [115200]

Use the **Bits per second** option to specify the serial port transmission speed. The speed must match the other side. Long or noisy lines may require lower speeds.

- **9600** Sets the serial port transmission speed at 9600.
 - **19200** Sets the serial port transmission speed at 19200.
 - **57600** Sets the serial port transmission speed at 57600.
 - **115200** **DEFAULT** Sets the serial port transmission speed at 115200.

→ Data Bits [8]

Use the **Data Bits** option to specify the number of data bits.

- 7 Sets the data bits at 7.
 - 8 **DEFAULT** Sets the data bits at 8.

→ Parity [None]

Use the **Parity** option to specify the parity bit that can be sent with the data bits for detecting the transmission errors.

- **None** **DEFAULT** No parity bit is sent with the data bits.
 - **Even** The parity bit is 0 if the number of ones in the data bits is even.

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- ➔ **Odd** The parity bit is 0 if the number of ones in the data bits is odd.
- ➔ **Mark** The parity bit is always 1. This option does not provide error detection.
- ➔ **Space** The parity bit is always 0. This option does not provide error detection.

➔ Stop Bits [1]

Use the **Stop Bits** option to specify the number of stop bits used to indicate the end of a serial data packet. Communication with slow devices may require more than 1 stop bit.

- ➔ **1** **DEFAULT** Sets the number of stop bits at 1.
- ➔ **2** Sets the number of stop bits at 2.

5.3.6 CPU Configuration

Use the **CPU Configuration** menu (**BIOS Menu 11**) to view detailed CPU specifications.

Aptio Setup Utility - Copyright (C) 2013 American Megatrends, Inc.		
Advanced		
CPU Information		
Intel(R) Atom(TM) CPU E3845 @ 1.91GHz	When enabled, a VMM can utilize the additional hardware capabilities provided by Vanderpool Technology	
CPU Signature	30673	
Microcode Patch	321	
Max CPU Speed	1910 MHz	
Min CPU Speed	500 MHz	
Processor Cores	4	
Intel HT Technology	Not Supported	
Intel VT-x Technology	Supported	

L1 Data Cache	24 kB x 4	➔: Select Screen
L1 Code Cache	32 kB x 4	↑ ↓: Select Item
L2 Cache	1024 kB x 2	Enter: Select
L3 Cache	Not Present	+/-: Change Opt.
64-bit	Supported	F1: General Help
 		F2: Previous Values
Intel Virtualization Technology	[Enabled]	F3: Optimized Defaults
EIST	[Enabled]	F4: Save & Exit
 		ESC: Exit
Version 2.16.1242. Copyright (C) 2013 American Megatrends, Inc.		

BIOS Menu 11: CPU Configuration

The CPU Configuration menu (**BIOS Menu 11**) lists the following CPU details:

- CPU Signature: Lists the CPU signature value.
- Microcode Patch: Lists the microcode patch being used.
- Max CPU Speed: Lists the maximum CPU processing speed.
- Min CPU Speed: Lists the minimum CPU processing speed.
- Processor Cores: Lists the number of the processor core
- Intel HT Technology: Indicates if Intel HT Technology is supported by the CPU.
- Intel VT-x Technology: Indicates if Intel VT-x Technology is supported by the CPU.
- L1 Data Cache: Lists the amount of data storage space on the L1 cache.
- L1 Code Cache: Lists the amount of code storage space on the L1 cache.
- L2 Cache: Lists the amount of storage space on the L2 cache.
- L3 Cache: Lists the amount of storage space on the L3 cache.

➔ Intel Virtualization Technology [Enabled]

Use the **Intel Virtualization Technology** option to enable or disable virtualization on the system. When combined with third party software, Intel® Virtualization technology allows several OSs to run on the same system at the same time.

- | | |
|-------------------|---|
| ➔ Disabled | Disables Intel Virtualization Technology. |
| ➔ Enabled | DEFAULT Enables Intel Virtualization Technology. |

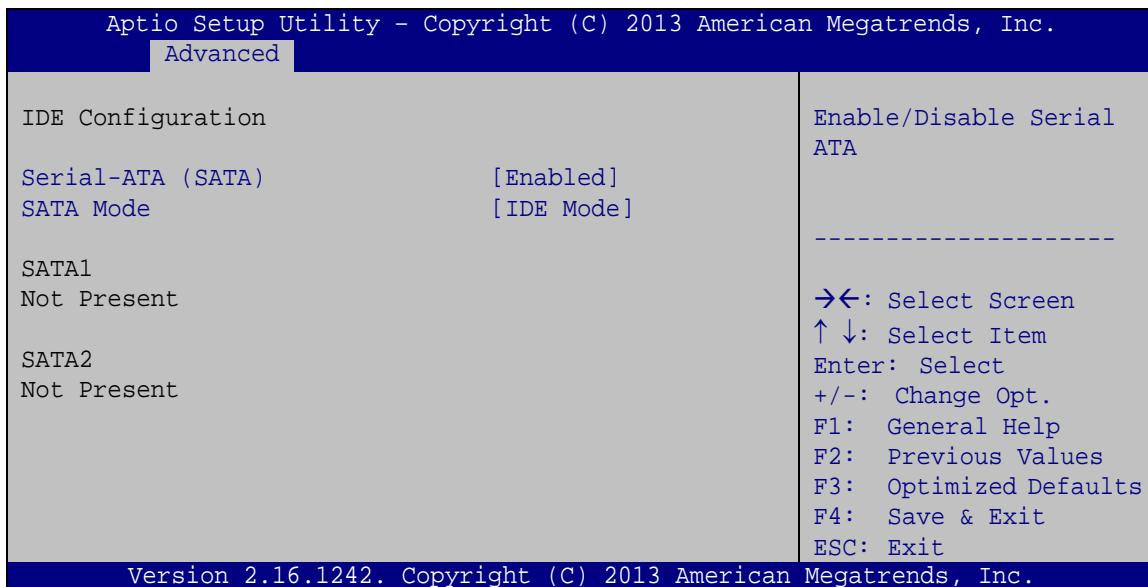
➔ EIST [Enabled]

Use the **EIST** option to enable or disable Enhanced Intel SpeedStep® Techonology (EIST).

- | | |
|-------------------|---|
| ➔ Disabled | Disables Enhanced Intel SpeedStep® Techonology. |
| ➔ Enabled | DEFAULT Enables Enhanced Intel SpeedStep® Techonology. |

5.3.7 IDE Configuration

Use the **IDE Configuration** menu (**BIOS Menu 12**) to view the SATA devices installed in the system.



BIOS Menu 12: IDE Configuration

➔ **Serial-ATA (SATA) [Enabled]**

Use the **Serial-ATA (SATA)** option to enable or disable the serial ATA controller.

➔ **Enabled** **DEFAULT** Enables the on-board SATA controller.

➔ **Disabled** Disables the on-board SATA controller.

➔ **SATA Mode Selection [IDE Mode]**

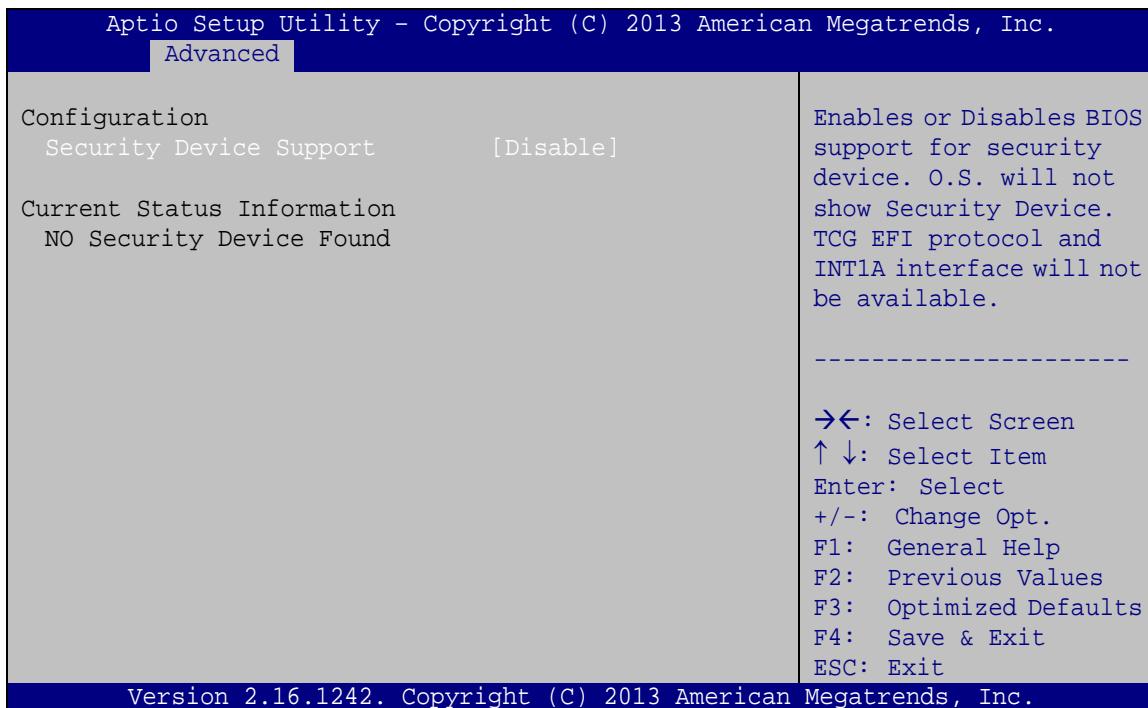
Use the **SATA Mode Selection** option to configure SATA devices as normal IDE devices.

➔ **IDE Mode** **DEFAULT** Configures SATA devices as normal IDE device.

➔ **AHCI Mode** Configures SATA devices as AHCI device.

5.3.8 Trusted Computing

Use the **Trusted Computing** menu (**BIOS Menu 13**) to configure settings related to the Trusted Computing Group (TCG) Trusted Platform Module (TPM).



BIOS Menu 13: Trusted Computing

➔ **Security Device Support [Disable]**

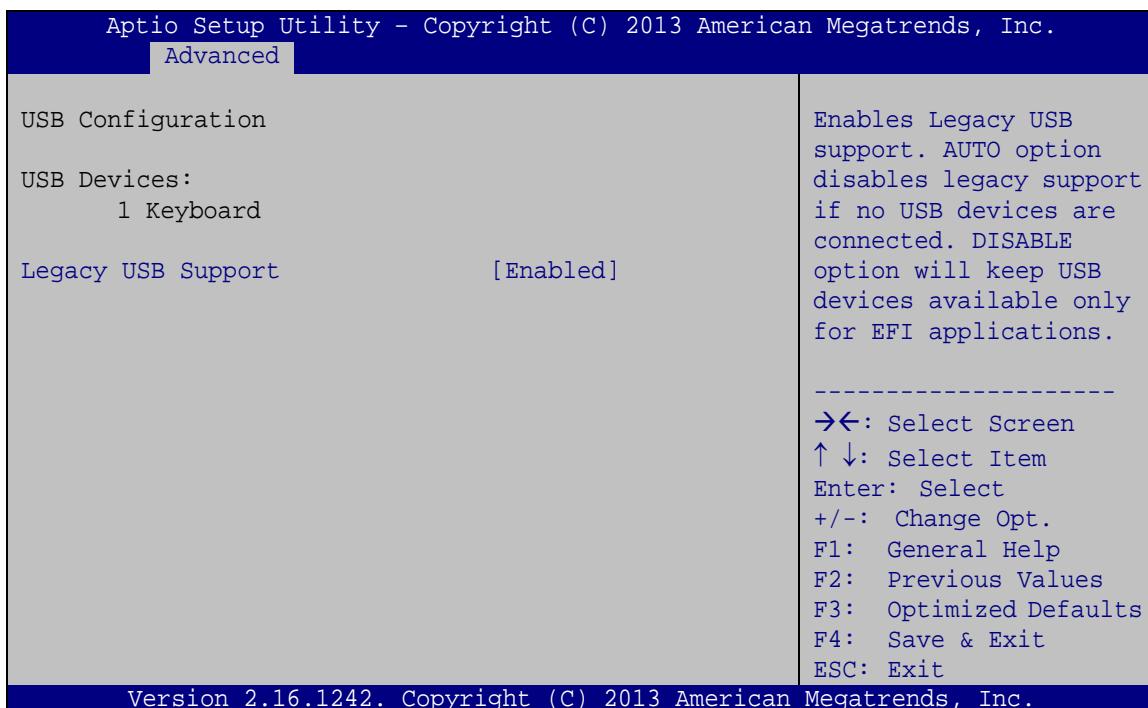
Use the **Security Device Support** option to configure support for the TPM.

- ➔ **Disable** DEFAULT TPM support is disabled.
- ➔ **Enable** TPM support is enabled.

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5.3.9 USB Configuration

Use the **USB Configuration** menu (**BIOS Menu 14**) to read USB configuration information and configure the USB settings.



BIOS Menu 14: USB Configuration

➔ **USB Devices**

The **USB Devices** field lists the USB devices that are enabled on the system

➔ **Legacy USB Support [Enabled]**

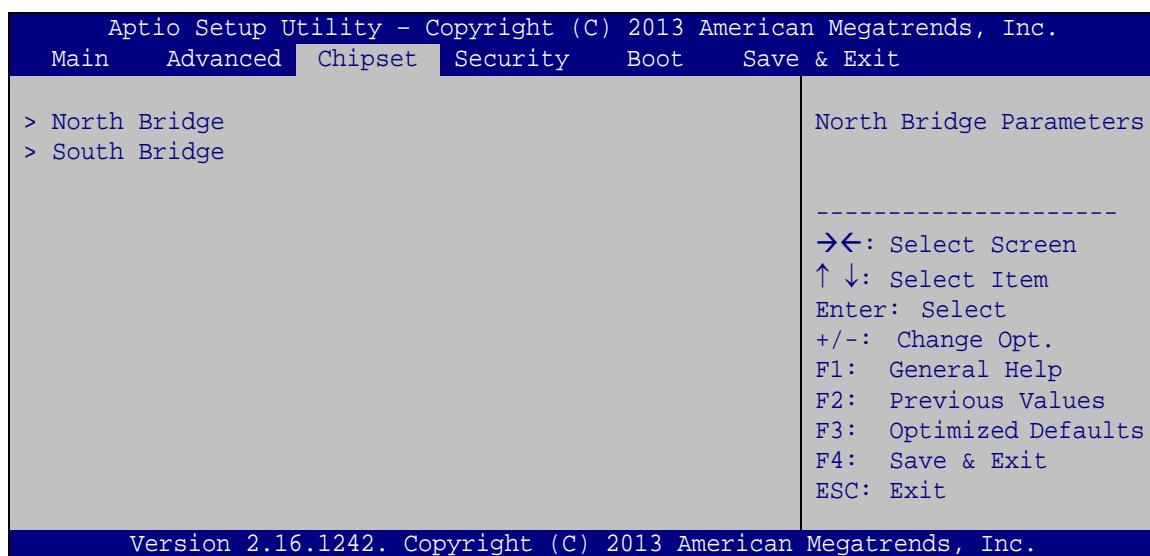
Use the **Legacy USB Support** BIOS option to enable USB mouse and USB keyboard support.

Normally if this option is not enabled, any attached USB mouse or USB keyboard does not become available until a USB compatible operating system is fully booted with all USB drivers loaded. When this option is enabled, any attached USB mouse or USB keyboard can control the system even when there is no USB driver loaded onto the system.

- ➔ **Enabled** **DEFAULT** Legacy USB support enabled
- ➔ **Disabled** Legacy USB support disabled
- ➔ **Auto** Legacy USB support disabled if no USB devices are connected

5.4 Chipset

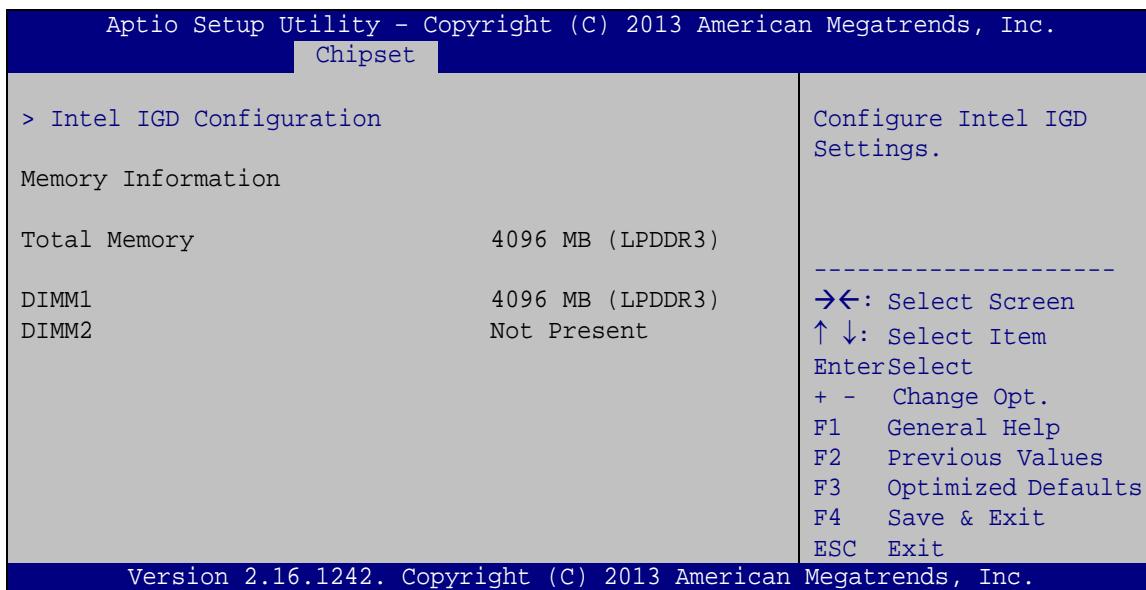
Use the **Chipset** menu (**BIOS Menu 15**) to access the Northbridge and Southbridge configuration menus.



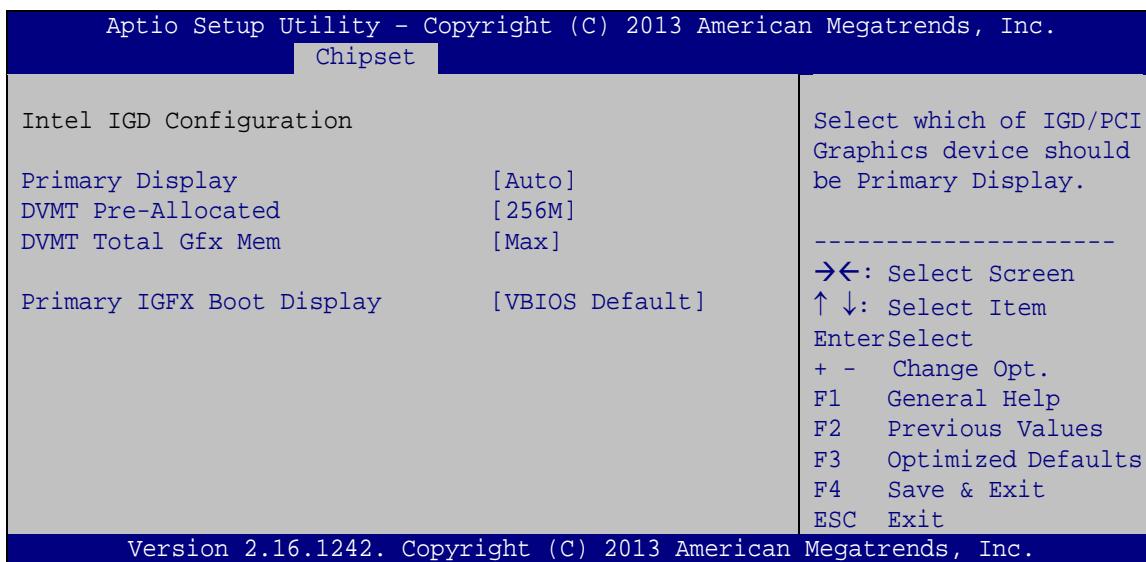
BIOS Menu 15: Chipset

eKINO-BT Mini-ITX SBC**5.4.1 North Bridge**

Use the **North Bridge** menu (**BIOS Menu 16**) to configure the north bridge parameters.

**BIOS Menu 16: North Bridge****5.4.1.1 Intel IGD Configuration**

Use the **Intel IGD Configuration** submenu (**BIOS Menu 17**) to configure the graphics settings.

**BIOS Menu 17: Intel IGD Configuration**

➔ Primary Display [Auto]

Use the **Primary Display** option to select the display device used by the system when it boots. Configuration options are listed below.

- Auto **DEFAULT**
- IGD
- PCI

➔ DVMT Pre-Allocated [256M]

Use the **DVMT Pre-Allocated** option to specify the amount of system memory that can be used by the internal graphics device.

- ➔ **64M** 64 MB of memory used by internal graphics device
- ➔ **128M** 128 MB of memory used by internal graphics device
- ➔ **256M** **DEFAULT** 256 MB of memory used by internal graphics device
- ➔ **512M** 512 MB of memory used by internal graphics device

➔ DVMT Total Gfx Mem [Max]

Use the **DVMT Total Gfx Mem** option to specify the maximum amount of memory that can be allocated as graphics memory. Configuration options are listed below.

- 128MB
- 256MB
- Max **Default**

➔ Primary IGFX Boot Display [VBIOS Default]

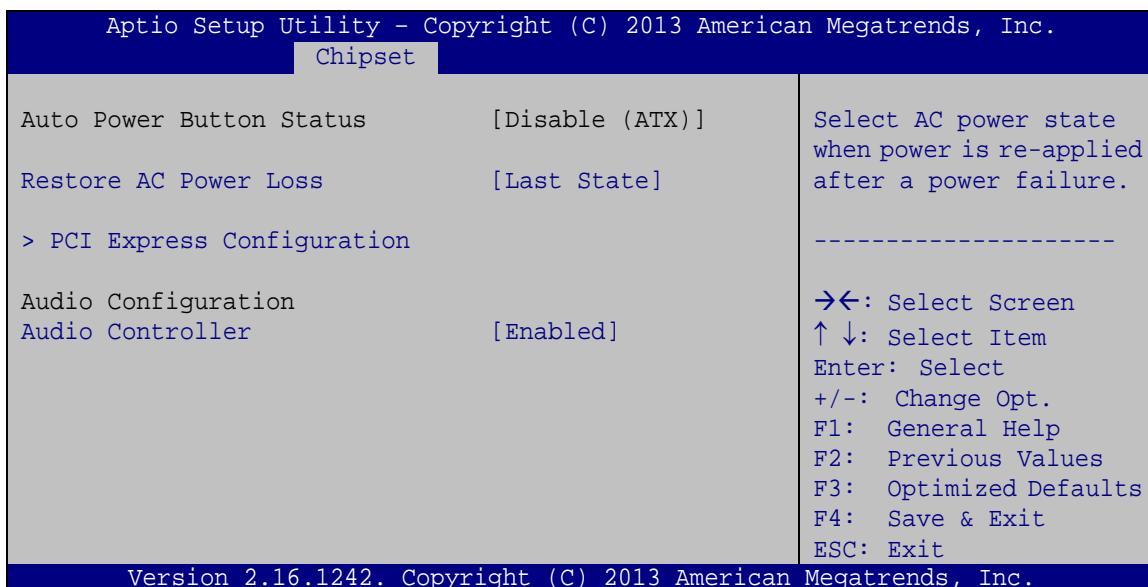
Use the **Primary IGFX Boot Display** option to select the display device used by the system when it boots. Configuration options are listed below.

eKINO-BT Mini-ITX SBC

- VBIOS Default **DEFAULT**
- CRT
- LVDS
- LVDS2

5.4.2 Southbridge Configuration

Use the **South Bridge** menu (**BIOS Menu 18**) to configure the Southbridge parameters.



BIOS Menu 18: Southbridge Configuration

➔ **Restore AC Power Loss [Last State]**

Use the **Restore AC Power Loss** BIOS option to specify what state the system returns to if there is a sudden loss of power to the system.

- ➔ **Power Off** The system remains turned off
- ➔ **Power On** The system turns on
- ➔ **Last State** **DEFAULT** The system returns to its previous state. If it was on, it turns itself on. If it was off, it remains off.

➔ **Audio Controller [Enabled]**

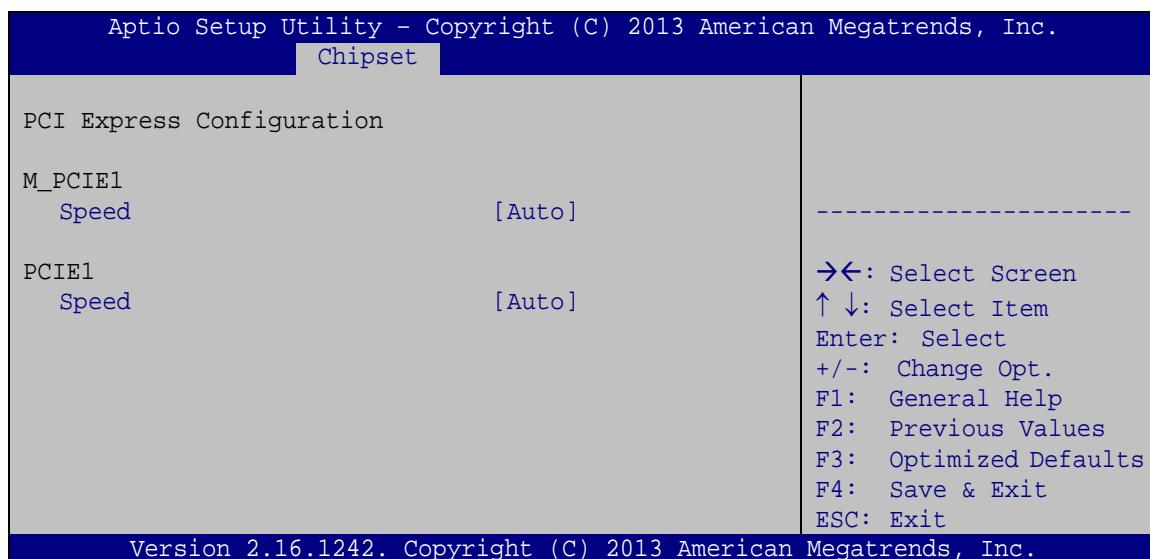
Use the **Audio Controller** BIOS option to enable or disable the High Definition Audio controller.

➔ **Disabled** The High Definition Audio controller is disabled.

➔ **Enabled** **DEFAULT** The High Definition Audio controller is enabled.

5.4.2.1 PCI Express Configuration

Use the **PCI Express Configuration** menu (**BIOS Menu 19**) to configure the PCI Express slots.



BIOS Menu 19: PCI Express Configuration

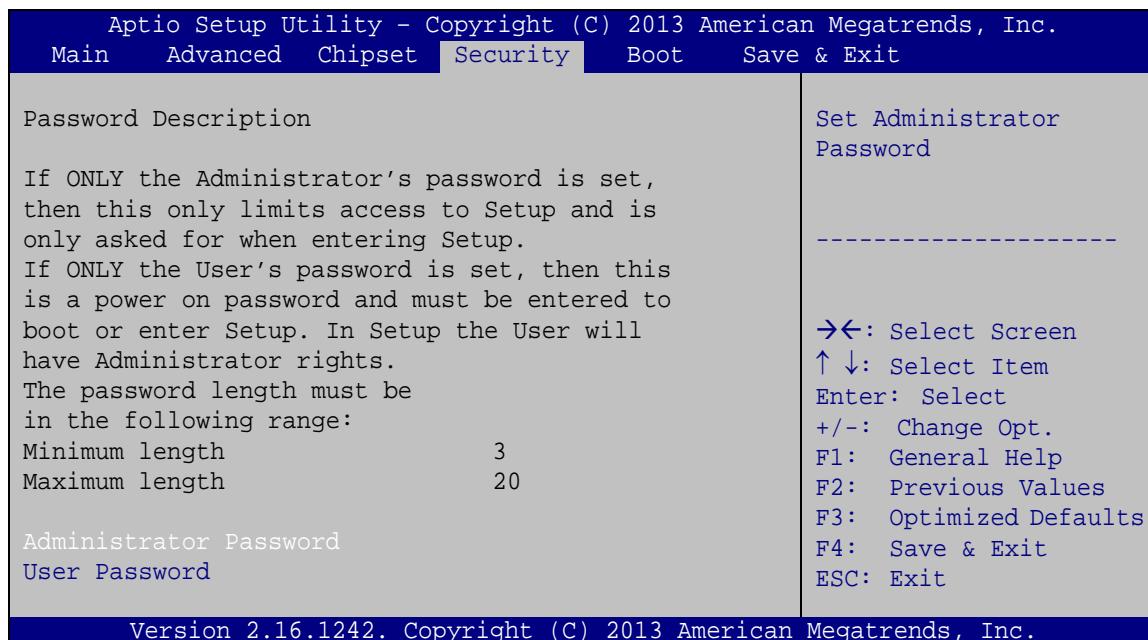
➔ **Speed [Auto]**

Use the **Speed** option to configure the PCIe Mini card and PCIe x1 slot speed.

- Auto **DEFAULT**
- Gen 2
- Gen 1

5.5 Security

Use the **Security** menu (**BIOS Menu 20**) to set system and user passwords.



BIOS Menu 20: Security

➔ Administrator Password

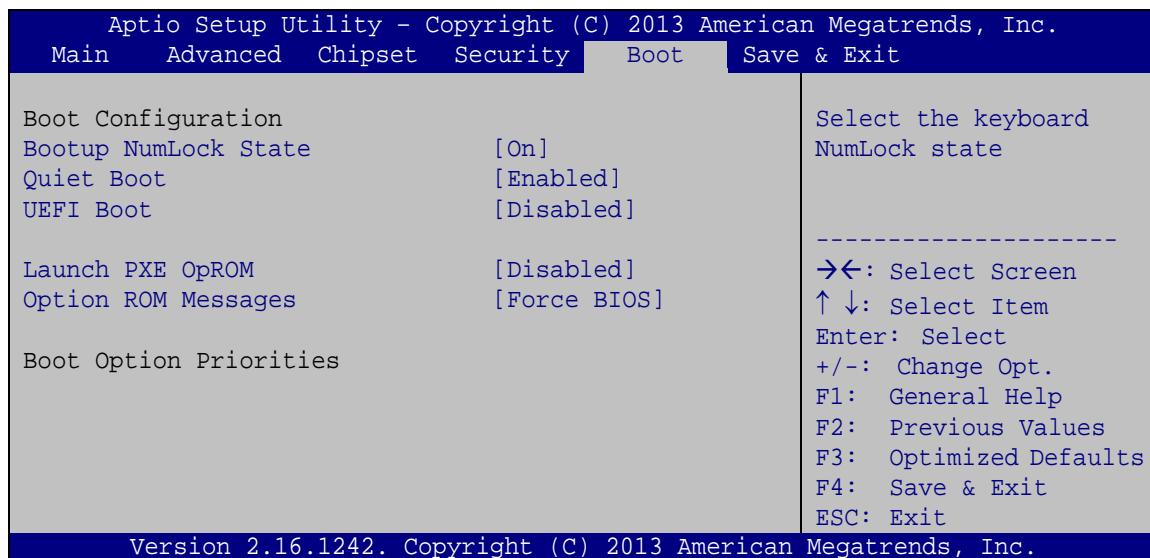
Use the **Administrator Password** to set or change an administrator password.

➔ User Password

Use the **User Password** to set or change a user password.

5.6 Boot

Use the **Boot menu (BIOS Menu 21)** to configure system boot options.



BIOS Menu 21: Boot

➔ Bootup NumLock State [On]

Use the **Bootup NumLock State** BIOS option to specify if the number lock setting must be modified during boot up.

➔ **On** **DEFAULT** Allows the Number Lock on the keyboard to be enabled automatically when the computer system boots up. This allows the immediate use of the 10-key numeric keypad located on the right side of the keyboard. To confirm this, the Number Lock LED light on the keyboard is lit.

➔ **Off** Does not enable the keyboard Number Lock automatically. To use the 10-keys on the keyboard, press the Number Lock key located on the upper left-hand corner of the 10-key pad. The Number Lock LED on the keyboard lights up when the Number Lock is engaged.

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→ Quiet Boot [Enabled]

Use the **Quiet Boot** BIOS option to select the screen display when the system boots.

- **Disabled** **DEFAULT** Normal POST messages displayed
- **Enabled** **DEFAULT** OEM Logo displayed instead of POST messages

→ UEFI Boot [Disabled]

Use the **UEFI Boot** BIOS option to allow the system to boot from the UEFI devices.

- **Disabled** **DEFAULT** Disables to boot from the UEFI devices.
- **Enabled** Enables to boot from the UEFI devices.

→ Launch PXE OpROM [Disabled]

Use the **Launch PXE OpROM** option to enable or disable boot option for legacy network devices.

- **Disabled** **DEFAULT** Ignore all PXE Option ROMs
- **Enabled** Load PXE Option ROMs.

→ Option ROM Messages [Force BIOS]

Use the **Option ROM Messages** option to set the Option ROM display mode.

- **Force BIOS** **DEFAULT** Sets display mode to force BIOS.
- **Keep Current** Sets display mode to current.

5.7 Save & Exit

Use the **Save & Exit** menu (**BIOS Menu 22**) to load default BIOS values, optimal failsafe values and to save configuration changes.



BIOS Menu 22: Save & Exit

➔ Save Changes and Reset

Use the **Save Changes and Reset** option to save the changes made to the BIOS options and reset the system.

➔ Discard Changes and Reset

Use the **Discard Changes and Reset** option to exit the system without saving the changes made to the BIOS configuration setup program.

➔ Restore Defaults

Use the **Restore Defaults** option to load the optimal default values for each of the parameters on the Setup menus. **F3 key can be used for this operation.**

➔ Save as User Defaults

Use the **Save as User Defaults** option to save the changes done so far as user defaults.

➔ Restore User Defaults

Use the **Restore User Defaults** option to restore the user defaults to all the setup options.

Chapter

6

Software Drivers

6.1 Available Drivers

All the drivers for the eKINO-BT are available on IEI Resource Download Center (<https://download.ieeworld.com>). Type eKINO-BT and press Enter to find all the relevant software, utilities, and documentation.

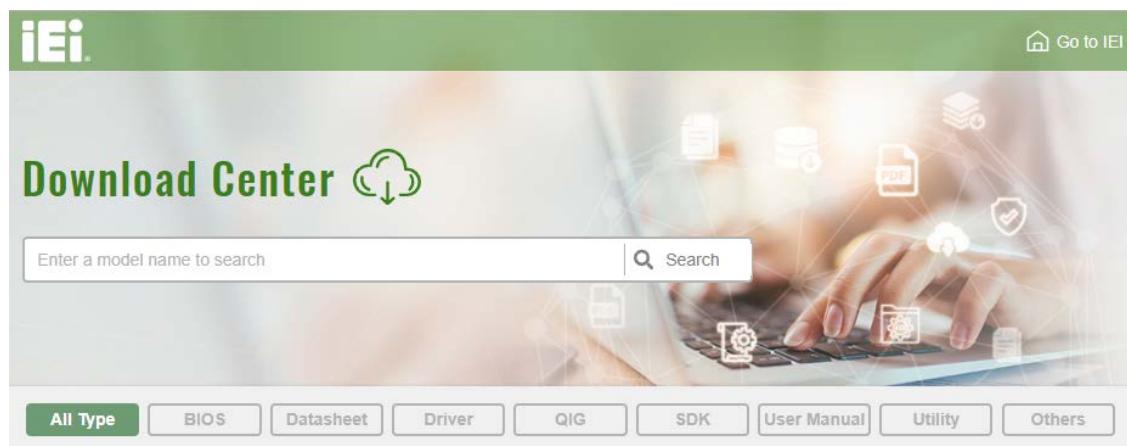
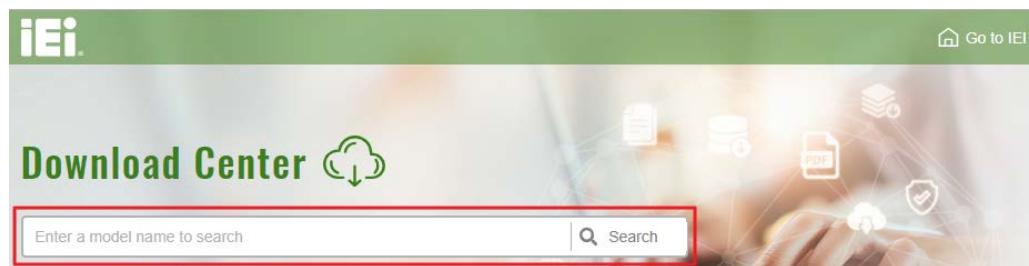


Figure 6-1: IEI Resource Download Center

6.2 Driver Download

To download drivers from IEI Resource Download Center, follow the steps below.

Step 1: Go to <https://download.ieeworld.com>. Type eKINO-BT and press Enter.



Step 2: All product-related software, utilities, and documentation will be listed. You can choose **Driver** to filter the result.

eKINO-BT Mini-ITX SBC

All Type BIOS Datasheet **Driver** QIG SDK User Manual Utility Others

i Keyword: "eKINO-BT", Searching Result : 24 Records.

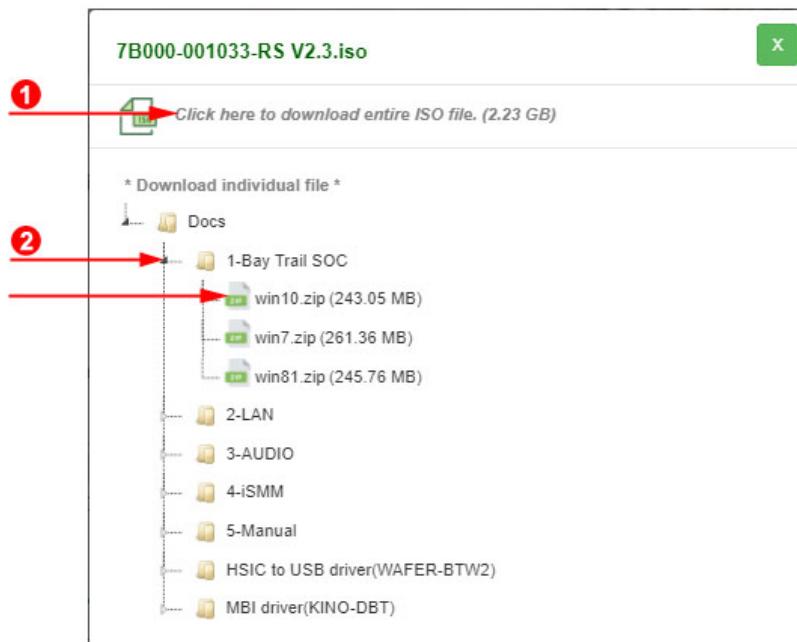
eKINO-BT

Embedded Computer ▶ Single Board Computer ▶ Industrial Motherboard

Mini-ITX SBC supports AUPS sub-system, 22nm Intel® Atom™/Celeron® on-board SoC

File Name	Published	Version	File Checksum
7B000-001033-RS V2.3.iso (2.23 GB)	2017/10/03	2.30	3B2DB1F792779A93A8F50DDBC3943E30

Step 3: Click the driver file name on the page and you will be prompted with the following window. You can download the entire ISO file (①), or double click an individual item to find its driver file and click the file name to download (②).

**NOTE:**

To install software from the downloaded ISO image file in Windows 8, 8.1 or 10, double-click the ISO file to mount it as a virtual drive to view its content. On Windows 7 system, an additional tool (such as Virtual CD-ROM Control Panel from Microsoft) is needed to mount the file.

Appendix

A

Regulatory Compliance

DECLARATION OF CONFORMITY

This equipment has been tested and found to comply with specifications for CE marking. If the user modifies and/or installs other devices in the equipment, the CE conformity declaration may no longer apply.

FCC WARNING

This equipment complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- This device may not cause harmful interference, and
- This device must accept any interference received, including interference that may cause undesired operation.

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 own expense.

Appendix

B

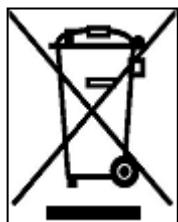
Product Disposal

**CAUTION:**

Risk of explosion if battery is replaced by an incorrect type. Only certified engineers should replace the on-board battery.

Dispose of used batteries according to instructions and local regulations.

- Outside the European Union – If you wish to dispose of used electrical and electronic products outside the European Union, please contact your local authority so as to comply with the correct disposal method.
- Within the European Union – The device that produces less waste and is easier to recycle is classified as electronic device in terms of the European Directive 2012/19/EU (WEEE), and must not be disposed of as domestic garbage.



EU-wide legislation, as implemented in each Member State, requires that waste electrical and electronic products carrying the mark (left) must be disposed of separately from normal household waste. This includes monitors and electrical accessories, such as signal cables or power cords. When you need to dispose of your device, please follow the guidance of your local authority, or ask the shop where you purchased the product. The mark on electrical and electronic products only applies to the current European Union Member States.

Please follow the national guidelines for electrical and electronic product disposal.

Appendix

C

BIOS Options

eKINO-BT Mini-ITX SBC

Below is a list of BIOS configuration options in the BIOS chapter.

□ System Date [xx/xx/xx]	79
□ System Time [xx:xx:xx]	80
□ ACPI Sleep State [S3 (Suspend to RAM)].....	81
□ Serial Port [Enabled].....	83
□ Change Settings [Auto]	83
□ Serial Port [Enabled].....	83
□ Change Settings [Auto]	84
□ Serial Port [Enabled].....	84
□ Change Settings [Auto]	84
□ Serial Port [Enabled].....	85
□ Change Settings [Auto]	85
□ Serial Port [Enabled].....	86
□ Change Settings [Auto]	86
□ Serial Port [Enabled].....	87
□ Change Settings [Auto]	87
□ Duplex Function [Full Duplex].....	88
□ PC Health Status	89
□ CPU_FAN1 Smart Fan Control [Manual Mode]	90
□ SYS_FAN1 Smart Fan Control [Auto Mode].....	90
□ Auto mode fan start/off temperature	91
□ Auto mode fan start PWM	91
□ Auto mode fan slope PWM.....	91
□ Wake system with Fixed Time [Disabled].....	92
□ Console Redirection [Disabled]	93
□ Terminal Type [ANSI].....	94
□ Bits per second [115200].....	94
□ Data Bits [8]	94
□ Parity [None].....	94
□ Stop Bits [1].....	95
□ Intel Virtualization Technology [Enabled]	96
□ EIST [Enabled].....	96
□ Serial-ATA (SATA) [Enabled]	97
□ SATA Mode Selection [IDE Mode]	97

<input type="checkbox"/> Security Device Support [Disable]	98
<input type="checkbox"/> USB Devices	99
<input type="checkbox"/> Legacy USB Support [Enabled]	99
<input type="checkbox"/> Primary Display [Auto]	102
<input type="checkbox"/> DVMT Pre-Allocated [256M]	102
<input type="checkbox"/> DVMT Total Gfx Mem [Max]	102
<input type="checkbox"/> Primary IGFX Boot Display [VBIOS Default]	102
<input type="checkbox"/> Restore AC Power Loss [Last State]	103
<input type="checkbox"/> Audio Controller [Enabled]	104
<input type="checkbox"/> Speed [Auto]	104
<input type="checkbox"/> Administrator Password	105
<input type="checkbox"/> User Password	105
<input type="checkbox"/> Bootup NumLock State [On]	106
<input type="checkbox"/> Quiet Boot [Enabled]	107
<input type="checkbox"/> UEFI Boot [Disabled]	107
<input type="checkbox"/> Launch PXE OpROM [Disabled]	107
<input type="checkbox"/> Option ROM Messages [Force BIOS]	107
<input type="checkbox"/> Save Changes and Reset	108
<input type="checkbox"/> Discard Changes and Reset	108
<input type="checkbox"/> Restore Defaults	108
<input type="checkbox"/> Save as User Defaults	108
<input type="checkbox"/> Restore User Defaults	108

Appendix

D

Digital I/O Interface

D.1 Introduction

The DIO connector on the eKINO-BT is interfaced to GPIO ports on the Super I/O chipset. The digital inputs and digital outputs are generally control signals that control the on/off circuit of external devices or TTL devices. Data can be read or written to the selected address to enable the DIO functions.



NOTE:

For further information, please refer to the datasheet for the Super I/O chipset.

The BIOS interrupt call **INT 15H** controls the digital I/O.

INT 15H:

AH – 6FH

Sub-function:

AL – 8 : Set the digital port as INPUT

AL : Digital I/O input value

D.2 Assembly Language Sample 1

```
MOV      AX, 6F08H      ;setting the digital port as input  
INT      15H           ;
```

AL low byte = value

AH – 6FH

Sub-function:

AL – 9 : Set the digital port as OUTPUT
BL : Digital I/O input value

D.3 Assembly Language Sample 2

```
MOV      AX, 6F09H      ;setting the digital port as output  
MOV      BL, 09H        ;digital value is 09H  
INT      15H           ;
```

Digital Output is 1001b

Appendix

E

Hazardous Materials Disclosure

eKINO-BT Mini-ITX SBC

The details provided in this appendix are to ensure that the product is compliant with the Peoples Republic of China (China) RoHS standards. The table below acknowledges the presences of small quantities of certain materials in the product, and is applicable to China RoHS only.

A label will be placed on each product to indicate the estimated "Environmentally Friendly Use Period" (EFUP). This is an estimate of the number of years that these substances would "not leak out or undergo abrupt change." This product may contain replaceable sub-assemblies/components which have a shorter EFUP such as batteries and lamps. These components will be separately marked.

Please refer to below table.

Part Name	Toxic or Hazardous Substances and Elements					
	Lead (Pb)	Mercury (Hg)	Cadmium (Cd)	Hexavalent Chromium (CR(VI))	Polybrominated Biphenyls (PBB)	Polybrominated Diphenyl Ethers (PBDE)
Housing	O	O	O	O	O	O
Display	O	O	O	O	O	O
Printed Circuit Board	O	O	O	O	O	O
Metal Fasteners	O	O	O	O	O	O
Cable Assembly	O	O	O	O	O	O
Fan Assembly	O	O	O	O	O	O
Power Supply Assemblies	O	O	O	O	O	O
Battery	O	O	O	O	O	O

O: This toxic or hazardous substance is contained in all of the homogeneous materials for the part is below the limit requirement in SJ/T11363-2006 (now replaced by GB/T 26572-2011).

X: This toxic or hazardous substance is contained in at least one of the homogeneous materials for this part is above the limit requirement in SJ/T11363-2006 (now replaced by GB/T 26572-2011).

此附件旨在确保本产品符合中国 RoHS 标准。以下表格标示此产品中某有毒物质的含量符合中国 RoHS 标准规定的限量要求。

本产品上会附有“环境友好使用期限”的标签，此期限是估算这些物质“不会有泄漏或突变”的年限。本产品可能包含有较短的环境友好使用期限的可替换元件，像是电池或灯管，这些元件将会单独标示出来。

部件名称	有毒有害物质或元素					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (Cr(VI))	多溴联苯 (PBB)	多溴二苯 醚 (PBDE)
壳体	O	O	O	O	O	O
显示	O	O	O	O	O	O
印刷电路板	O	O	O	O	O	O
金属螺帽	O	O	O	O	O	O
电缆组装	O	O	O	O	O	O
风扇组装	O	O	O	O	O	O
电力供应组装	O	O	O	O	O	O
电池	O	O	O	O	O	O

O: 表示该有毒有害物质在该部件所有物质材料中的含量均在 SJ/T 11363-2006 (现由 GB/T 26572-2011 取代) 标准规定的限量要求以下。

X: 表示该有毒有害物质至少在该部件的某一均质材料中的含量超出 SJ/T 11363-2006 (现由 GB/T 26572-2011 取代) 标准规定的限量要求。