

**MODEL:**  
**KINO-DQM871-i1**

**Mini-ITX SBC with 4th Generation 22nm Intel® Core™ CPU  
Up to 16.0 GB DDR3, HDMI, LVDS, DisplayPort, VGA  
Dual GbE, SATA 6Gb/s, USB 3.0, PCIe Mini,  
PCIe x16, Intel® AMT 9.0, IPMI 2.0, RoHS**

## **User Manual**

# Revision

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Date	Version	Changes
September 23, 2015	1.02	Modified the total number of the internal USB 2.0 ports
July 16, 2015	1.01	Updated Section 4.7.1: AT/ATX Mode Selection
June 23, 2014	1.00	Initial release

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# Manual Conventions

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## **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.



## **HOT SURFACE**

This symbol indicates a hot surface that should not be touched without taking care.



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Chapter

1

# Introduction

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## 1.1 Introduction



**Figure 1-1: KINO-DQM871-i1**

The KINO-DQM871-i1 is a Mini-ITX SBC with a 4<sup>th</sup> generation 22nm Intel® Core™ or Celeron® processor and Intel® QM87 Express Chipset. Storage on the board is handled by two SATA 6Gb/s ports, two SATA 3Gb/s ports and one PCIe Mini socket.

The KINO-DQM871-i1 features Intelligent Platform Management Interface (IPMI) that helps lower the overall costs of server management by enabling users to maximize IT resource, save time and manage multiple systems. The KINO-DQM871-i1 supports IPMI 2.0 through the optional iRIS-1010 module.

The board has four types of graphics outputs that support triple independent display. A VGA output connects to a VGA monitor. One LVDS connector supports 18/24-bit dual-channel display. Two HDMI connectors support HDMI 1080p display and an internal DisplayPort connector supports DisplayPort displays.

Other slots and connectors include RS-232 ports, RS-422/485 port, Gigabit Ethernet, USB 3.0 ports, USB 2.0 ports, TPM, SMBus and digital I/O.

## KINO-DQM871-i1 Mini-ITX SBC

### 1.2 Model Variations

There are four models of the KINO-DQM871-i1 series. The model variations are listed in **Table 1-1**.

Model	On-board Processor			
	Name	Speed	Cache	Max TDP
KINO-DQM871-i1-i7	Intel® Core™ i7-4700EQ processor	2.4 GHz	6 MB	47 W
KINO-DQM871-i1-i5E	Intel® Core™ i5-4402E processor	1.6 GHz	3 MB	25 W
KINO-DQM871-i1-i3E	Intel® Core™ i3-4102E processor	1.6 GHz	3 MB	25 W
KINO-DQM871-i1-CE	Intel® Celeron® processor 2002E	1.5 GHz	2 MB	25 W

**Table 1-1: Model Variations**

### 1.3 Benefits

Some of the KINO-DQM871-i1 motherboard benefits include:

- Low power consumption
- Wide range of I/O interfaces
- Triple independent display support



## 1.4 Features

Some of the KINO-DQM871-i1 motherboard features are listed below:

- Mini-ITX form factor
- RoHS compliant
- 4th generation 22mm Intel® Core™ or Celeron® processor
- 1066/1333/1600MHz dual-channel DDR3 SDRAM
- Supports IPMI 2.0 via IEI iRIS-1010 module
- Intel® AMT 9.0 support
- Dual GbE
- Supports VGA, HDMI, LVDS and DisplayPort interface for triple independent display (HDMI V1.4a compliant)
- 12 USB ports (eight USB 2.0, four USB 3.0)
- Five RS-232 serial ports and one RS-422/485 serial port
- One full-size PCIe Mini card slot for mSATA installation
- One PCIe x16 slot

## KINO-DQM871-i1 Mini-ITX SBC

### 1.5 Connectors

The connectors on the KINO-DQM871-i1 are shown in the figure below.

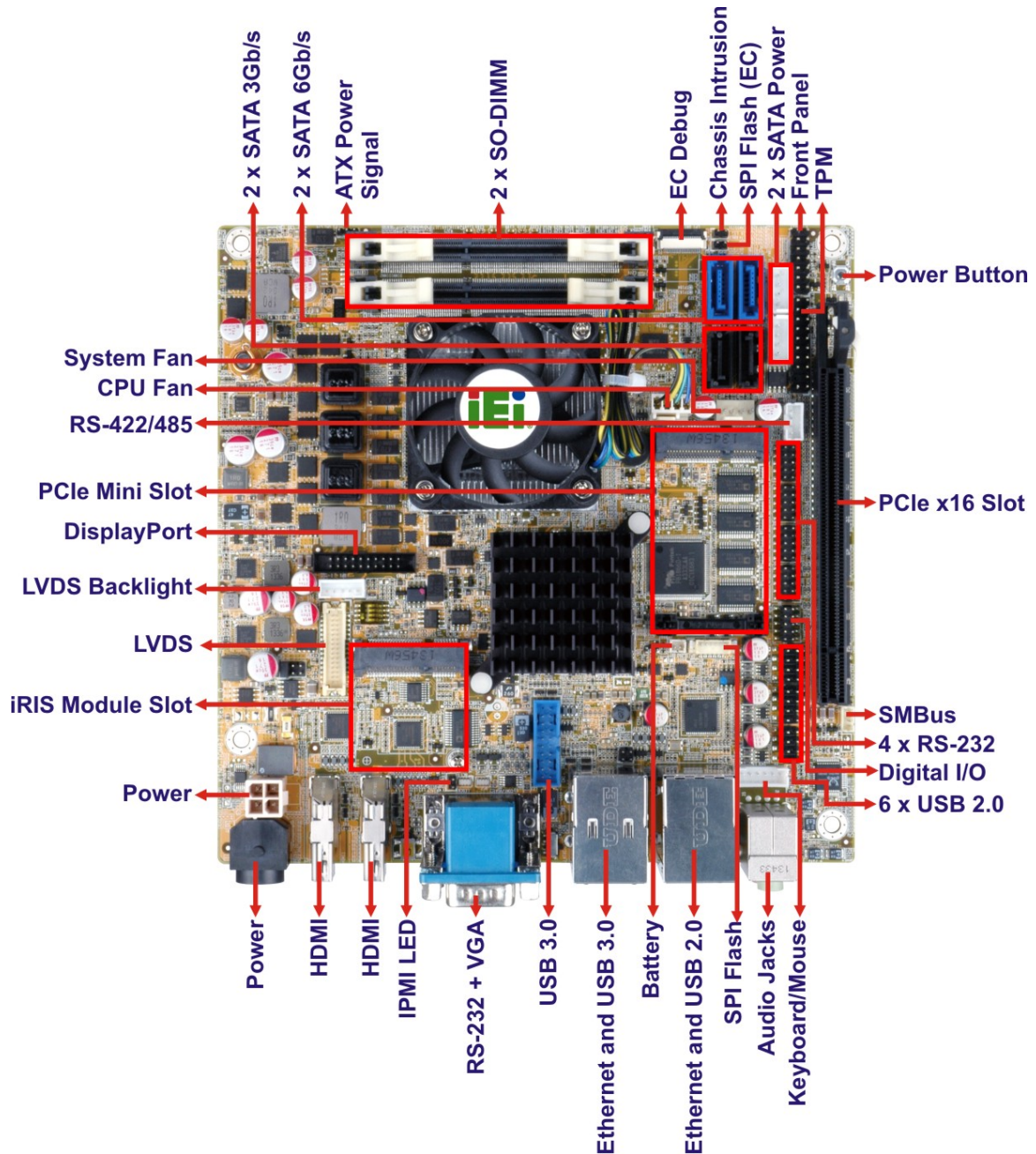


Figure 1-2: Connectors

## 1.6 Dimensions

The main dimensions of the KINO-DQM871-i1 are shown in the diagram below.

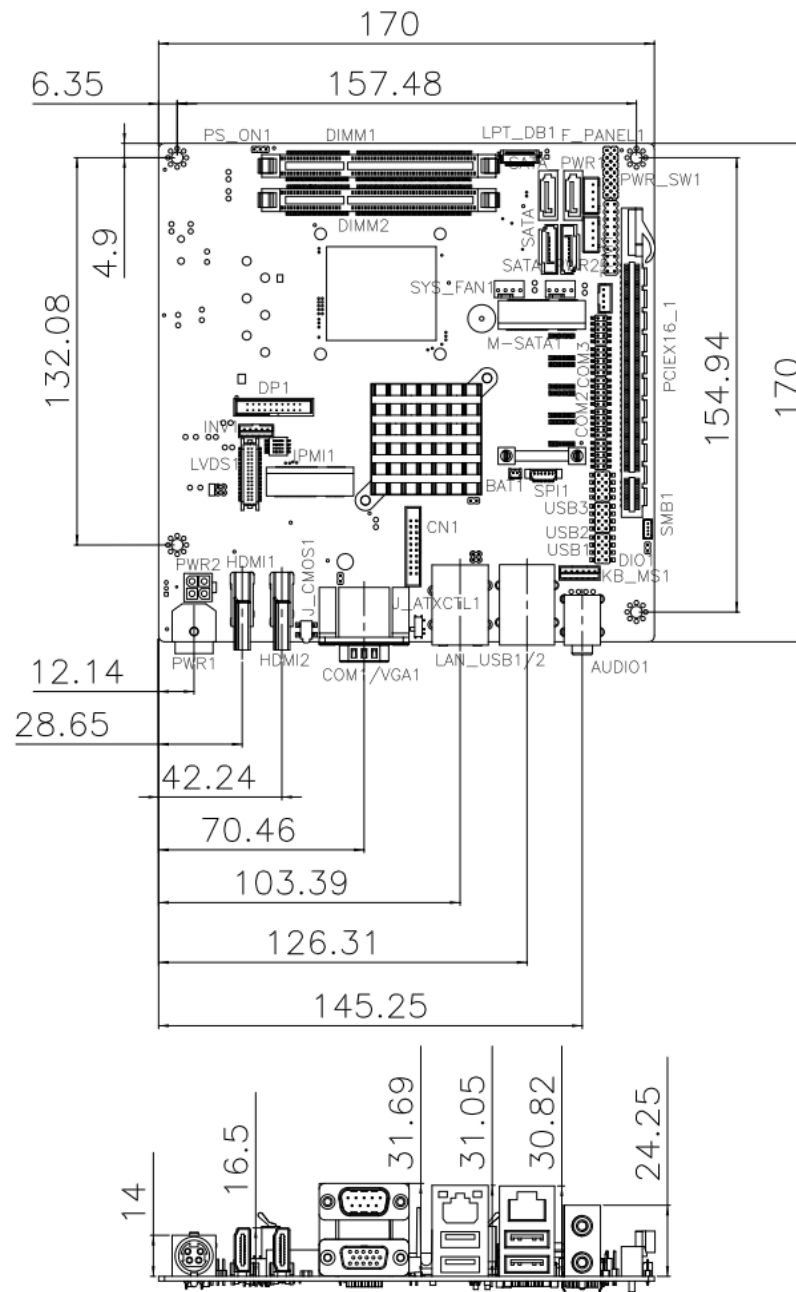
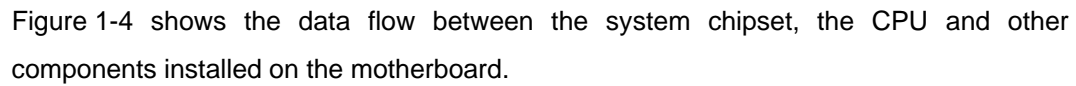


Figure 1-3: KINO-DQM871-i1 Dimensions (mm)



## KINO-DQM871-i1 Mini-ITX SBC

## 1.7 Data Flow



The diagram illustrates the system architecture of the KINO-DQM871-i1. At the top is the **4th Gen. 22nm Intel® Mobile Processor**, which connects to a **PCIe x16 Slot** via **PCIe x16** and to **2 x SO-DIMM** via **DDR3 (1066/1333/1600 MHz)**. The processor is connected to the **Intel® QM87 PCH** via **FDI** and **DMI (5 Gbps) (x4)**. The PCH manages various interfaces:

- Storage and Expansion:**
  - Intel® I217 (PHY)** and **Intel® I211 PCIe Controller** connect via **PCIe x1** to **LAN1 (Intel® AMT 9.0)** and **LAN2 (IPMI 2.0)**.
  - Full-size PCIe Mini** connects via **PCIe x1 mSATA** and **USB 2.0**.
  - 2 x External USB** and **2 x Internal USB** connect via **USB 3.0**.
  - 2 x External USB** and **6 x Internal USB** connect via **USB 2.0**.
  - SPI ROM** connects via **SPI**.
- Display and Video:**
  - eDP** connects to **eDP to LVDS**, which then connects to **LVDS (18-bit/24-bit)**.
  - DDI** connects to **DisplayPort** and **TMDs Level Shifter**, which then connects to **2 x HDMI**.
  - CRT** connects to **VGA Connector**.
- Storage and Power:**
  - SATA** connects to **2 x SATA 6Gb/s** and **2 x SATA 3Gb/s**.
  - 2 x SATA Power** is provided.
- Audio:**
  - HDA** connects to **Realtek ALC662**, which then connects to **Audio Connectors: Mic-in, Line-out**.
- System Management and I/O:**
  - iRIS Module Slot**, **TPM**, and **ITE IT8528 EC** connect via **LPC** to the **Super I/O Fintek F81866**.
  - CPU Fan** and **System Fan** connect to the Super I/O.
  - Keyboard & Mouse** connect to the Super I/O.
  - COM1 (DB-9)**, **COM2~5 (RS-232)**, and **COM6 (RS-422/485)** connect to the Super I/O.
  - DIO** connects via **GPIO** to the Super I/O.



## 1.8 Technical Specifications

KINO-DQM871-i1 technical specifications are listed in Table 1-2.

Specification	KINO-DQM871-i1
Form Factor	Mini-ITX
On-board Processor	<ul style="list-style-type: none"><li>▪ <b>Standard</b><ul style="list-style-type: none"><li>○ Intel® Core™ i7-4700EQ processor with Intel® AMT 9.0 support (2.4 GHz, quad-core, 6 MB cache, 47 W TDP)</li><li>○ Intel® Core™ i5-4402E processor with Intel® AMT 9.0 support (1.6 GHz, dual-core, 3 MB cache, 25 W TDP)</li><li>○ Intel® Core™ i3-4102E processor (1.6 GHz, dual-core, 3 MB cache, 25 W TDP)</li><li>○ Intel® Celeron® 2002E processor (1.5 GHz, dual-core, 2 MB cache, 25 W TDP)</li></ul></li><li>▪ <b>By request</b><ul style="list-style-type: none"><li>○ Intel® Core™ i5-4400E processor with Intel® AMT 9.0 support (2.7 GHz, dual-core, 3 MB cache, 37 W TDP)</li><li>○ Intel® Core™ i3-4100E processor (2.4 GHz, dual-core, 3 MB cache, 37 W TDP)</li><li>○ Intel® Celeron® 2000E processor (2.2 GHz, dual-core, 2 MB cache, 37 W TDP)</li></ul></li></ul>
System Chipset	Intel® QM87
Memory	Two 204-pin 1600/1333/1066 MHz DDR3 SO-DIMM supported (system max. 16.0 GB)
Graphics Engine	Intel® HD Graphics Gen 7.5 supports DirectX 11.1, OpenGL 3.2, OpenCL 1.2, full MPEG2, VC1, AVC decode
BIOS	UEFI BIOS
Ethernet Controllers	<b>LAN1:</b> Intel® I217LM PHY (through PCIe x1) with Intel® AMT 9.0 support <b>LAN2:</b> Intel® I211-AT PCIe Ethernet controller (through PCIe x1) with NCSI and IPMI 2.0 support
Audio	Realtek ALC662 HD Audio codec





## KINO-DQM871-i1 Mini-ITX SBC

<b>Super I/O Controller</b>	Fintek F81866
<b>EC</b>	ITE IT8528
<b>Digital I/O</b>	8-bit, 4-bit input/4-bit output
<b>IPMI 2.0</b>	Supported by the optional iRIS-1010 module
<b>Watchdog Timer</b>	Software programmable supports 1~255 sec. system reset
<b>Expansion</b>	1 x Full-size PCIe Mini slot (colay mSATA) 1 x PCIe x16 slot
<b>I/O Interface Connectors</b>	
<b>Display Output Ports</b> (Triple Display Supported)	1 x VGA (up to 1920 x 1200 @ 60 Hz) 2 x HDMI (up to 2500 x 1600 @ 60 Hz) 1 x 18/24-bit dual-channel LVDS by CH7511B DP to LVDS converter (up to 1920 x 1200 @ 60 Hz) 1 x DisplayPort via on-board box header supports HDMI, LVDS, VGA, DVI and DisplayPort (up to 3840 x 2160 @ 60 Hz)
<b>Fan connector</b>	One 4-pin wafer for CPU fan One 4-pin wafer for system fan
<b>Keyboard/Mouse</b>	One internal 6-pin wafer connector
<b>Serial Ports</b>	Five RS-232 COM connectors (four by pin header, one on rear side) One RS-422/485 COM connector (4-pin wafer)
<b>USB Ports</b>	Eight USB 2.0 ports (six by 8-pin header, two on rear side ) Four USB 3.0 ports (two by pin header, two on rear side)
<b>SMBus</b>	One 4-pin wafer connector
<b>TPM</b>	One 20-pin header
<b>Storage</b>	
<b>SATA</b>	2 x SATA 6Gb/s 2 x SATA 3Gb/s with RAID 0/1/5/10 support
<b>Environmental and Power Specifications</b>	
<b>Power Supply</b>	12V only, AT/ATX support

<b>Power Connector</b>	1 x External 4-pin DIN DC jack 1 x Internal 4-pin (2x2) power connector
<b>Power Consumption</b>	12 V @ 5.84 A (2.4 GHz Intel® Core™ i7-4770EQ processor with two 4 GB 1600 MHz DDR3 memory)
<b>Operating Temperature</b>	-20°C ~ 60°C (32°F ~ 140°F)
<b>Storage Temperature</b>	-30°C ~ 70°C
<b>Operating Humidity</b>	5% ~ 95% (non-condensing)
<b>Physical Specifications</b>	
<b>Dimensions</b>	170 mm x 170 mm
<b>Weight GW/NW</b>	900 g/450 g

Table 1-2: Technical Specifications

Chapter

2

# Packing List

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## 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.

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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



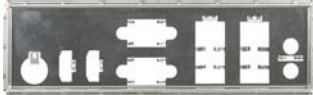


When the KINO-DQM871-i1 is unpacked, please do the following:

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



**KINO-DQM871-i1 Mini-ITX SBC****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 KINO-DQM871-i1 was purchased from or contact an IEI sales representative directly by sending an email to [sales@ieiworld.com](mailto:sales@ieiworld.com)

The KINO-DQM871-i1 is shipped with the following components:

Quantity	Item and Part Number	Image
1	KINO-DQM871-i1 SBC	
2	SATA and power cable (P/N: 32801-000100-100-RS)	
1	I/O shielding (P/N: 45014-0048C0-00-RS)	
1	Mini jumper pack (2.0mm) (P/N: 33101-000657-RS)	
1	Utility CD	








Quantity	Item and Part Number	Image
1	One Key Recovery CD	
1	Quick installation guide	



**Table 2-1: Packing List**

## 2.4 Optional Items

These optional items are available.

Item and Part Number	Image
IPMI 2.0 adapter card with AST1010 BMC chip (without KVM over IP function) for PCIe Mini socket interface (P/N: iRIS-1010-R10)	
RS-232 cable with Bracket (P/N:19800-000300-100-RS)	
RS-422/485 cable (P/N: 32205-003800-100-RS)	
Dual USB cable (w bracket) (P/N: 19800-003100-300-RS)	
Dual-port USB 3.0 cable with bracket (P/N: 19800-010500-100-RS)	

**KINO-DQM871-i1 Mini-ITX SBC**

Item and Part Number	Image
KB/MS PS/2 Y-cable (P/N: 32000-023800-RS)	
Infineon TPM module (P/N: TPM-IN01-R11)	

**Table 2-2: Optional Items**

Chapter

3

# Connector Pinouts

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## KINO-DQM871-i1 Mini-ITX SBC

### 3.1 Peripheral Interface Connectors

Section 3.1.1 shows peripheral interface connector locations. Section 3.1.2 lists all the peripheral interface connectors seen in Section 3.1.1.

#### 3.1.1 Layout

The figure below shows the on-board peripheral connectors, rear panel peripheral connectors and on-board jumpers.

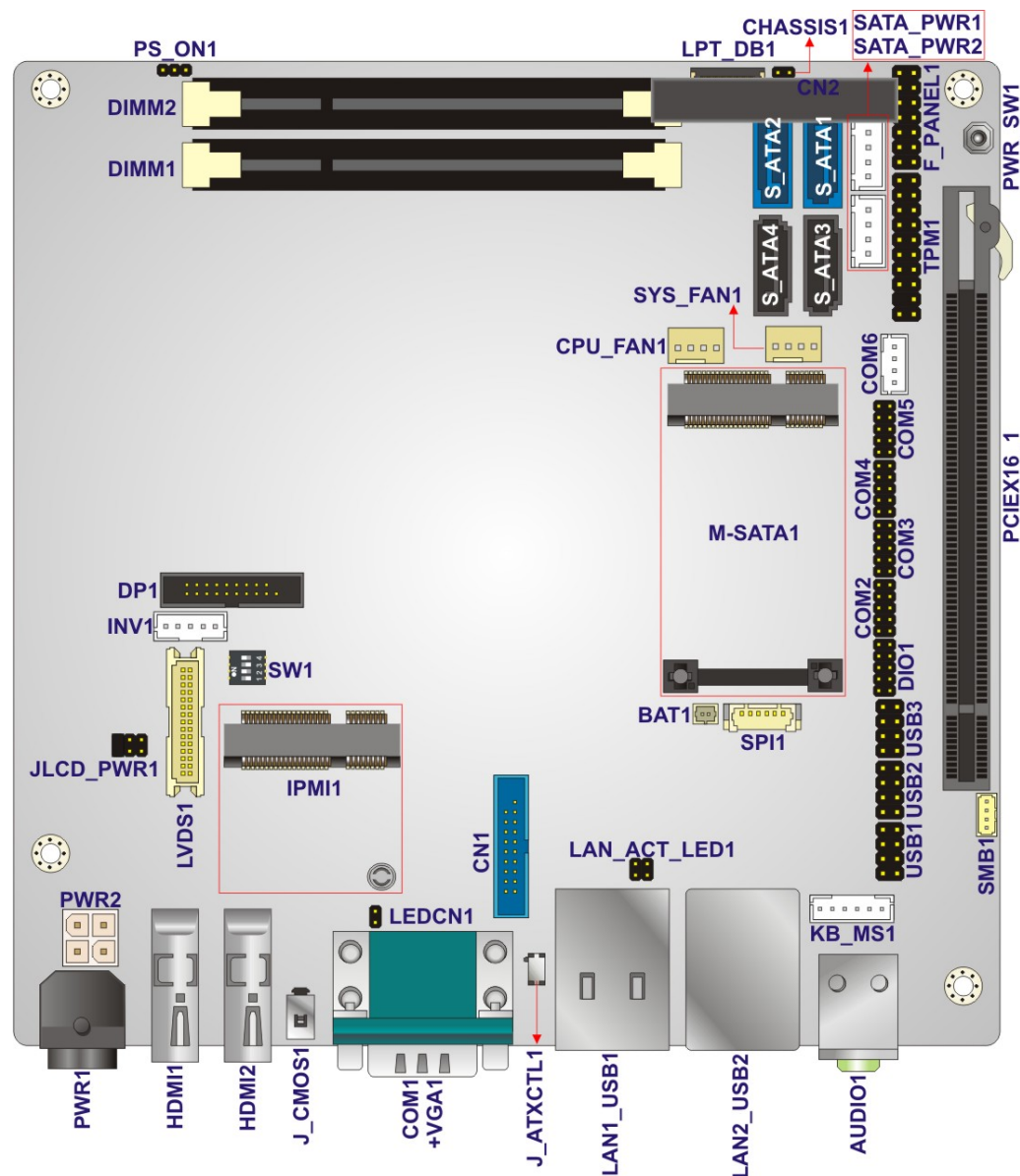


Figure 3-1: Connector and Jumper Locations



3.1.2 Peripheral Interface Connectors

The table below shows a list of the peripheral interface connectors on the KINO-DQM871-i1. Detailed descriptions of these connectors can be found below.

Connector	Type	Label
ATX power signal connector	3-pin header	PS_ON1
Battery connector	2-pin wafer	BAT1
Chassis intrusion connector	2-pin header	CHASSIS1
Digital I/O connector	10-pin header	DIO1
DisplayPort connector	20-pin box header	DP1
EC debug connector	20-pin FPC	LPT_DB1
Fan connector (CPU)	4-pin wafer	CPU_FAN1
Fan connector (system)	4-pin wafer	SYS_FAN1
Front panel connector	14-pin header	F_PANEL1
iRIS module slot	Half-size PCIe Mini card slot	IPMI1
IPMI active LED connector	2-pin header	LEDCN1
Keyboard/mouse connector	6-pin wafer	KB_MS1
LAN active LED connector	4-pin header	LAN_ACT_LED1
LVDS connector	30-pin crimp	LVDS1
LVDS backlight connector	5-pin wafer	INV1
PCIe Mini card slot	Full-size PCIe Mini card slot	M-SATA1
PCIe x16 slot	PCIe x16 slot	PCIEX16_1
Power button (on-board)	Push button	PWR_SW1
Power connector (12V)	4-pin connector	PWR2
RS-232 serial ports	10-pin header	COM2, COM3, COM4, COM5
RS-422/485 serial port	4-pin wafer	COM6
SATA 3Gb/s connectors	SATA connector	S_ATA3, S_ATA4





**KINO-DQM871-i1 Mini-ITX SBC**

Connector	Type	Label
SATA 6Gb/s connectors	SATA connector	S_ATA1, S_ATA2
SATA power connectors	4-pin wafer	SATA_PWR1, SATA_PWR2
SMBus connector	4-pin wafer	SMB1
SO-DIMM connectors	SO-DIMM connector	DIMM1, DIMM2
SPI Flash connector	6-pin wafer	SPI1
SPI Flash connector (EC)	2-pin header	CN2
TPM connector	20-pin header	TPM1
USB 2.0 connectors	8-pin header	USB1, USB2, USB3
USB 3.0 connector	20-pin box header	CN1

**Table 3-1: Peripheral Interface Connectors****3.1.3 External Interface Panel Connectors**

The table below lists the rear panel connectors on the KINO-DQM871-i1. Detailed descriptions of these connectors can be found in a later section.

Connector	Type	Label
Audio jacks (mic-in, line-out)	Audio jack	AUDIO1
Ethernet and USB 2.0 connectors	RJ-45 and USB 2.0	LAN2_USB2
Ethernet and USB 3.0 connectors	RJ-45 and USB 3.0	LAN1_USB1
HDMI connectors	HDMI	HDMI1, HDMI2
Power connector	4-pin DIN	PWR1
RS-232 serial port	D-sub 9	COM1
VGA connector	D-sub 15	VGA1

**Table 3-2: Rear Panel Connectors**

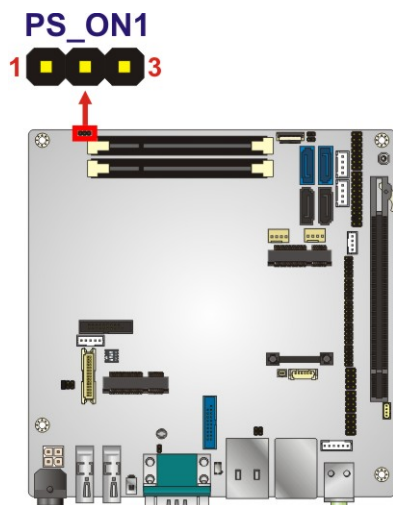
## 3.2 Internal Peripheral Connectors

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 KINO-DQM871-i1.

### 3.2.1 ATX Power Signal Connector

<b>CN Label:</b>	<b>PS_ON1</b>
<b>CN Type:</b>	3-pin header
<b>CN Location:</b>	See <b>Figure 3-2</b>
<b>CN Pinouts:</b>	See <b>Table 3-3</b>

This connector provides power-on signal for ATX power mode. Users can use the power-on signal to work with devices that need to receive the PS\_ON signal in ATX mode.



**Figure 3-2: ATX Power Signal Connector Location**

Pin	Description
1	5VSB
2	EC_PSON#
3	GND

**Table 3-3: ATX Power Signal Connector Pinouts**

## KINO-DQM871-i1 Mini-ITX SBC

### 3.2.2 Battery Connector



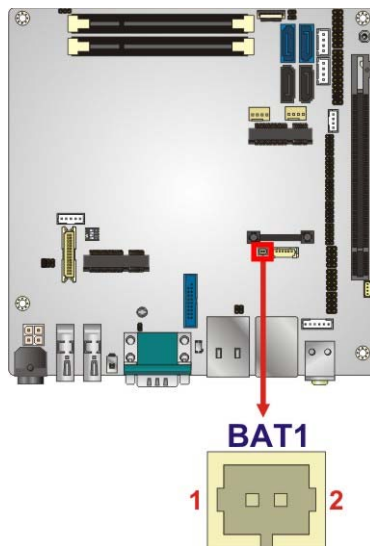
#### CAUTION:

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.

<b>CN Label:</b>	<b>BAT1</b>
<b>CN Type:</b>	2-pin wafer
<b>CN Location:</b>	See <b>Figure 3-3</b>
<b>CN Pinouts:</b>	See <b>Table 3-4</b>

This is connected to the system battery. The battery provides power to the system clock to retain the time when power is turned off.



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

Pin	Description
1	Battery+
2	Ground

Table 3-4: Battery Connector Pinouts

### 3.2.3 Chassis Intrusion Connector

- CN Label:** CHASSIS1
- CN Type:** 2-pin header
- CN Location:** See Figure 3-4
- CN Pinouts:** See Table 3-5

The chassis intrusion connector is for a chassis intrusion detection sensor or switch that detects if a chassis component is removed or replaced.

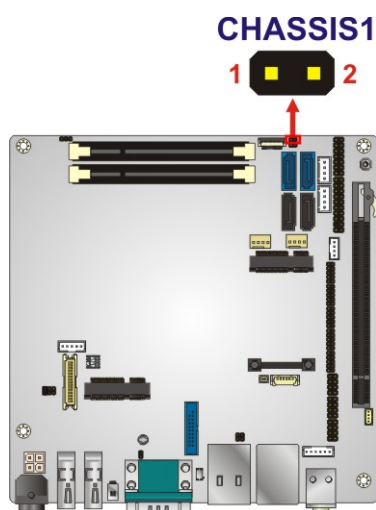


Figure 3-4: Chassis Intrusion Connector Location

Pin	Description
1	Pull High +3.3V
2	CHASSIS OPEN

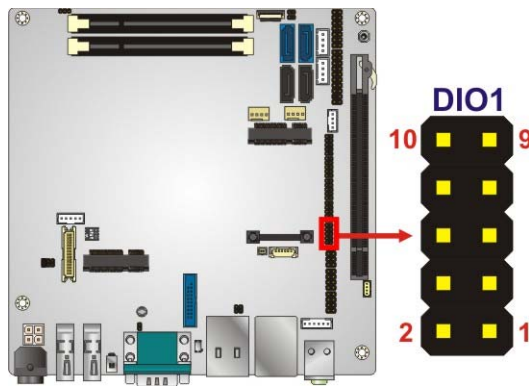
Table 3-5: Chassis Intrusion Connector Pinouts

## KINO-DQM871-i1 Mini-ITX SBC

## 3.2.4 Digital I/O Connector

<b>CN Label:</b>	<b>DIO1</b>
<b>CN Type:</b>	10-pin header
<b>CN Location:</b>	See <b>Figure 3-5</b>
<b>CN Pinouts:</b>	See <b>Table 3-6</b>

The digital I/O connector provides programmable input and output for external devices.  
The digital I/O provides 4-bit output and 4-bit input.



**Figure 3-5: Digital I/O Connector Location**

Pin	Description	Pin	Description
1	GND	2	+5V
3	Output 3	4	Output 2
5	Output 1	6	Output 0
7	Input 3	8	Input 2
9	Input 1	10	Input 0

**Table 3-6: Digital I/O Connector Pinouts**

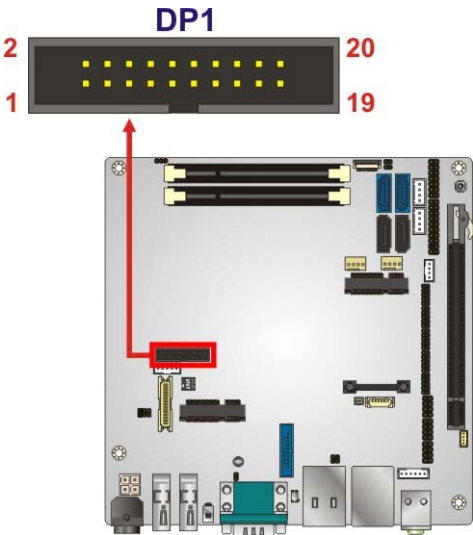
## 3.2.5 DisplayPort Connector

<b>CN Label:</b>	<b>DP1</b>
<b>CN Type:</b>	20-pin box header
<b>CN Location:</b>	See <b>Figure 3-6</b>



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

The internal DisplayPort connector supports HDMI, LVDS, VGA, DVI and DisplayPort connection with up to 3840 x 2160 resolutions.



**Figure 3-6: DisplayPort Connector Location**

Pin	Description	Pin	Description
1	TMDS_B_HPD#	2	AUX_P2
3	GND	4	AUX_N2
5	DP2_CFG1	6	GND
7	GND	8	DPB_OB_LANE2_P
9	DPB_OB_LANE3_P	10	DPB_OB_LANE2_N
11	DPB_OB_LANE3_N	12	GND
13	GND	14	DPB_OB_LANE0_P
15	DPB_OB_LANE1_P	16	DPB_OB_LANE0_N
17	DPB_OB_LANE1_N	18	+3.3V
19	+5V	20	NC

**Table 3-7: DisplayPort Connector Pinouts**

## KINO-DQM871-i1 Mini-ITX SBC

## 3.2.6 EC Debug Connector

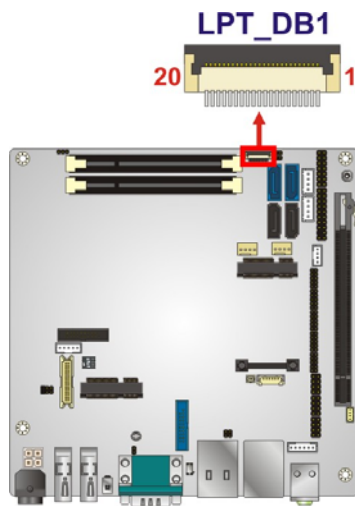
**CN Label:** LPT\_DB1

**CN Type:** 20-pin FPC

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

**CN Pinouts:** See **Table 3-8**

The connector is for EC debug only.



**Figure 3-7: BIOS Debug Port Location**

Pin	Description	Pin	Description
1	KSI0	11	KSO9
2	KSO0	12	KSO10
3	KSO1	13	KSO12
4	KSO2	14	KSI1
5	KSO3	15	KSO11
6	KSO4	16	KSI2
7	KSO5	17	KSI3
8	KSO6	18	GND
9	KSO7	19	GND
10	KSO8	20	GND

**Table 3-8: EC Debug Port Pinouts**

### 3.2.7 Fan Connector (CPU)

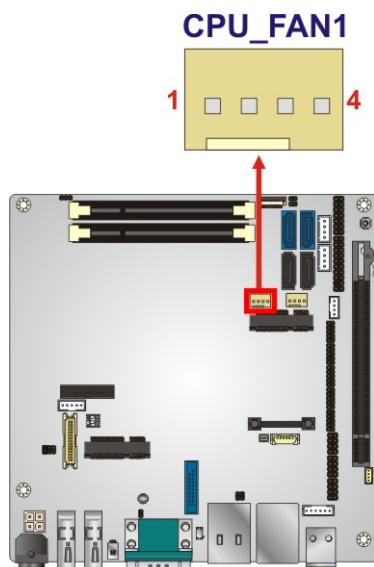
**CN Label:** CPU\_FAN1

**CN Type:** 4-pin wafer

**CN Location:** See **Figure 3-8**

**CN Pinouts:** See **Table 3-9**

The fan connector attaches to a CPU cooling fan.



**Figure 3-8: CPU Fan Connector Location**

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

**Table 3-9: CPU Fan Connector Pinouts**

### 3.2.8 Fan Connector (System)

**CN Label:** SYS\_FAN1

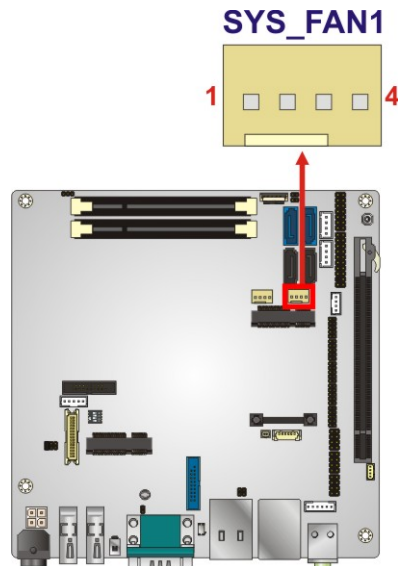
**CN Type:** 4-pin wafer

**KINO-DQM871-i1 Mini-ITX SBC**

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

**CN Pinouts:** See **Table 3-10**

The fan connector attaches to a system cooling fan.



**Figure 3-9: System Fan Connector Location**

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

**Table 3-10: System Fan Connector Pinouts**

### 3.2.9 Front Panel Connector

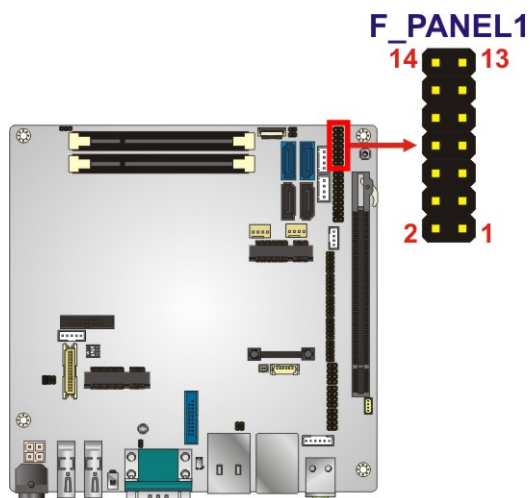
**CN Label:** **F\_PANEL1**

**CN Type:** 14-pin header

**CN Location:** See **Figure 3-10**

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

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



**Figure 3-10: Front Panel Connector Location**

	Pin	Description		Pin	Description
Power LED	1	PWR_LED+	Buzzer	2	SPKR+
	3	NC		4	NC
	5	PWR_LED-		6	NC
Power Button	7	PWR_BTN+		8	SPKR-
	9	PWR_BTN-	Reset	10	NC
HDD LED	11	HDD_LED+		12	Reset+
	13	HDD_LED-		14	Reset-

**Table 3-11: Front Panel Connector Pinouts**

### 3.2.10 iRIS Module Slot

**CN Label:** IPMI1

**CN Type:** Half-size PCIe Mini card slot

**CN Location:** See **Figure 3-11**

The iRIS module slot is used to install the IEI iRIS-1010 IPMI 2.0 module.



**KINO-DQM871-i1 Mini-ITX SBC****WARNING:**

The iRIS module slot is designed to install the IEI iRIS-1010 IPMI 2.0 module only. DO NOT install other modules into the iRIS module slot. Doing so may cause damage to the KINO-DQM871-i1.

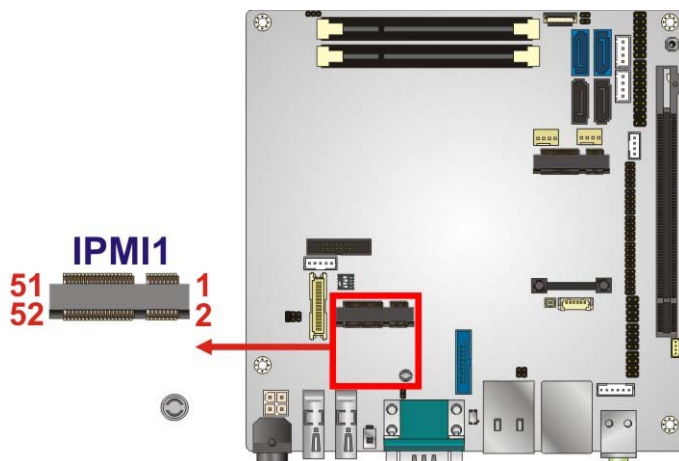
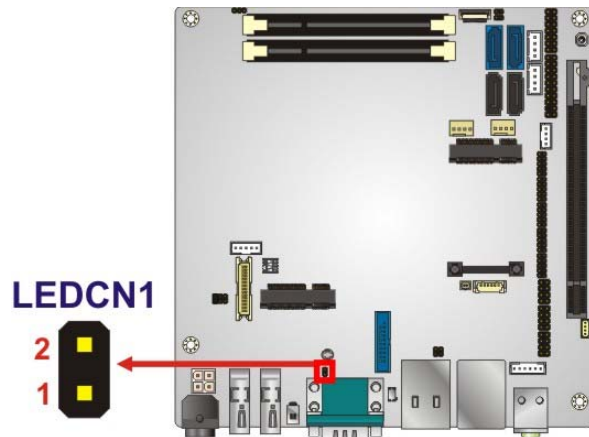


Figure 3-11: iRIS Module Slot Location

**3.2.11 IPMI Active LED Connector**

<b>CN Label:</b>	<b>LEDCN1</b>
<b>CN Type:</b>	2-pin header
<b>CN Location:</b>	See <b>Figure 3-12</b>
<b>CN Pinouts:</b>	See <b>Table 3-12</b>

The connector is for IPMI active LED connection.



**Figure 3-12: IPMI Active LED Connector**

Pin	Description
1	IPMI_LED+
2	IPMI_LED-

**Table 3-12: IPMI Active LED Connector Pinouts**

### 3.2.12 Keyboard/Mouse Connector

<b>CN Label:</b>	<b>KB_MS1</b>
<b>CN Type:</b>	6-pin wafer
<b>CN Location:</b>	See <b>Figure 3-13</b>
<b>CN Pinouts:</b>	See <b>Table 3-13</b>

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

## KINO-DQM871-i1 Mini-ITX SBC

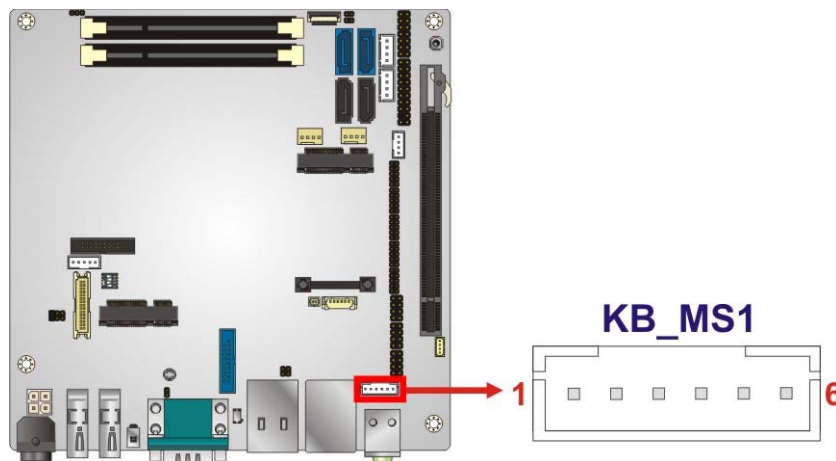


Figure 3-13: Keyboard/Mouse Connector Location

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

Table 3-13: Keyboard/Mouse Connector Pinouts

## 3.2.13 LAN Active LED Connector

**CN Label:** LAN\_ACT\_LED1

**CN Type:** 4-pin header

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

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

The connector is for active LED connection of the external LAN ports.

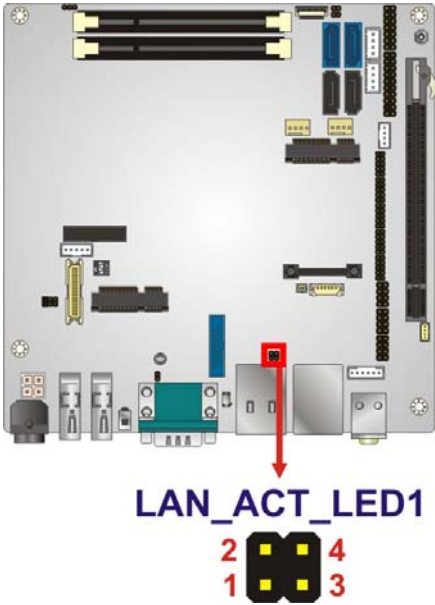


Figure 3-14: LAN Active LED Connector Location

Pin	Description	Pin	Description
1	LAN1_LINK_ACT-	2	V_3P3_LAN
3	LAN2_LINK_ACT-	4	+3.3A

Table 3-14: LAN Active LED Connector Pinouts

3.2.14 LVDS Connector

- CN Label:

LVDS1
- CN Type:

30-pin crimp
- CN Location:

See Figure 3-15
- CN Pinouts:

See Table 3-15

The LVDS connector is for an LCD panel connected to the board.

## KINO-DQM871-i1 Mini-ITX SBC

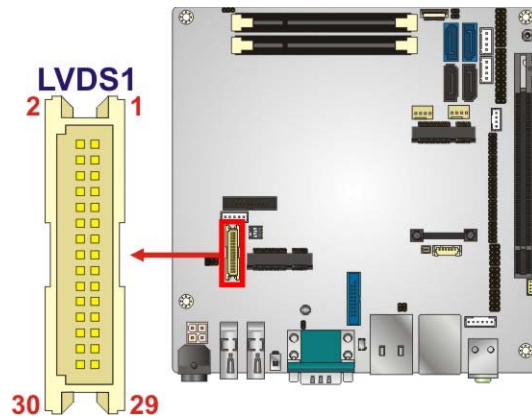


Figure 3-15: LVDS Connector Location

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
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 3-15: LVDS Connector Pinouts



3.2.15 LVDS Backlight Connector

- CN Label:

INV1
- CN Type:

5-pin wafer
- CN Location:

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

See **Table 3-16**

The backlight inverter connectors provide power to LCD panels.

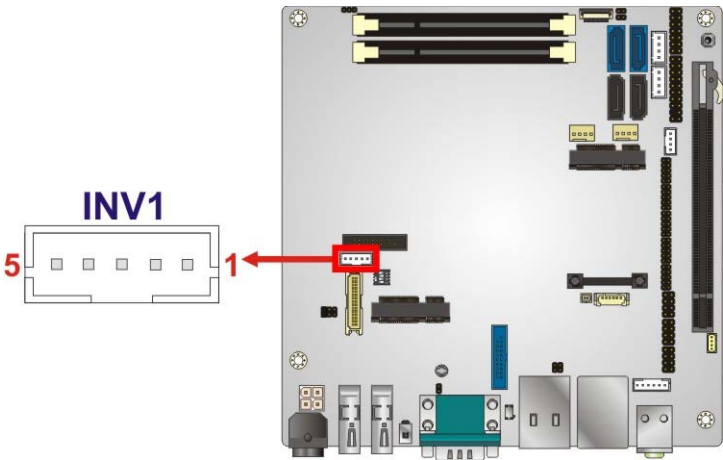


Figure 3-16: LVDS Backlight Inverter Connector

Pin	Description
1	BRIGHTNESS
2	GROUND
3	+12VS_LCD_BKL
4	GROUND
5	BACKLIGHT ENABLE

Table 3-16: Backlight Inverter Connector Pinouts

3.2.16 PCIe Mini Card Slot

- CN Label:

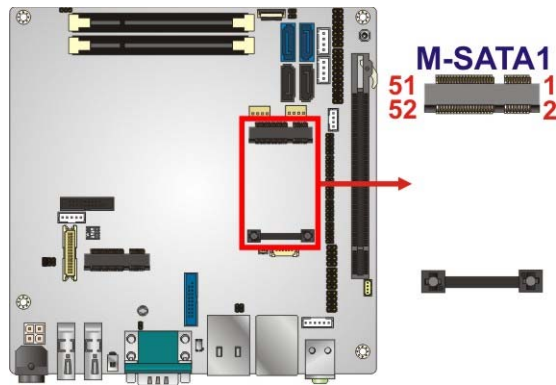
M-SATA1
- CN Type:

Full-size PCIe Mini card slot
- CN Location:

See **Figure 3-17**

**KINO-DQM871-i1 Mini-ITX SBC****CN Pinouts:** See **Table 3-17**

The PCIe Mini card slot enables a PCIe Mini card expansion module to be connected to the board. Cards supported include among others PCIe Mini cards and mSATA cards.

**Figure 3-17: 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	N/C	18	GND
19	N/C	20	+3.3 V
21	GND	22	PCIRST#
23	PERN2 (SATA_RX4+)	24	3VDual
25	PERP2 (SATA_RX4-)	26	GND
27	GND	28	+1.5V
29	GND	30	SMBCLK
31	PETN2 (SATA_TX4-)	32	SMBDATA
33	PETP2 (SATA_TX4+)	34	GND
35	GND	36	USBD-

Pin	Description	Pin	Description
37	GND	38	USBD+
39	VCC3	40	GND
41	VCC3	42	N/C
43	SATA_DET4_R_N	44	N/C
45	CL_CLK	46	N/C
47	CL_DATA	48	+1.5V
49	CL_RST_N	50	GND
51	MSATA_SEL#	52	VCC3

**Table 3-17: PCIe Mini Card Slot Pinouts**

## 3.2.17 PCI Express x16 Slot

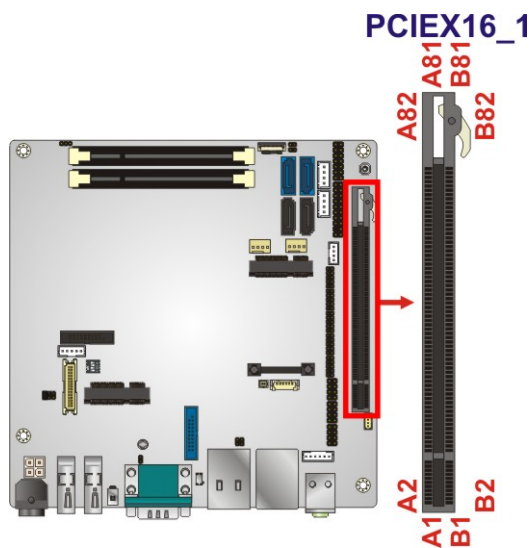
**CN Label:** PCIEX16\_1

**CN Type:** PCIe x16 slot

**CN Location:** See **Figure 3-18**

**CN Pinouts:** See **Table 3-18** (Side A) **Table 3-19** (Side B)

The PCIe x16 expansion cards slot is for PCIe x16 expansion cards.



**Figure 3-18: PCIe x16 Slot Location**

## KINO-DQM871-i1 Mini-ITX SBC

Pin	Description	Pin	Description	Pin	Description	Pin	Description
A1	Name	A22	HSIn(1)	A43	HSIp(6)	A64	HSIp(11)
A2	PRSNT#1	A23	GND	A44	HSIn(6)	A65	HSIn(11)
A3	+12v	A24	GND	A45	GND	A66	GND
A4	+12v	A25	HSIp(2)	A46	GND	A67	GND
A5	GND	A26	HSIn(2)	A47	HSIp(7)	A68	HSIp(12)
A6	JTAG2	A27	GND	A48	HSIn(7)	A69	HSIn(12)
A7	JTAG3	A28	GND	A49	GND	A70	GND
A8	JTAG4	A29	HSIp(3)	A50	RSVD	A71	GND
A9	JTAG5	A30	HSIn(3)	A51	GND	A72	HSIp(13)
A10	+3.3v	A31	GND	A52	HSIp(8)	A73	HSIn(13)
A11	+3.3v	A32	RSVD	A53	HSIn(8)	A74	GND
A12	PWRGD	A33	RSVD	A54	GND	A75	GND
A13	GND	A34	GND	A55	GND	A76	HSIp(14)
A14	REFCLK+	A35	HSIp(4)	A56	HSIp(9)	A77	HSIn(14)
A15	REFCLK-	A36	HSIn(4)	A57	HSIn(9)	A78	GND
A16	GND	A37	GND	A58	GND	A79	GND
A17	HSIp(0)	A38	GND	A59	GND	A80	HSIp(15)
A18	HSIn(0)	A39	HSIp(5)	A60	HSIp(10)	A81	HSIn(15)
A19	GND	A40	HSIn(5)	A61	HSIn(10)	A82	GND
A20	RSVD	A41	GND	A62	GND		
A21	GND	A42	GND	A63	GND		

**Table 3-18: PCIe x16 Side A Pinouts**

Pin	Description	Pin	Description	Pin	Description	Pin	Description
B1	+12v	B22	GND	B43	GND	B64	GND
B2	+12v	B23	HSOp(2)	B44	GND	B65	GND
B3	RSVD	B24	HSOn(2)	B45	HSOp(7)	B66	HSOp(12)
B4	GND	B25	GND	B46	HSOn(7)	B67	HSOn(12)
B5	SMCLK	B26	GND	B47	GND	B68	GND
B6	SMDAT	B27	HSOp(3)	B48	PRSNT#2	B69	GND
B7	GND	B28	HSOn(3)	B49	GND	B70	HSOp(13)

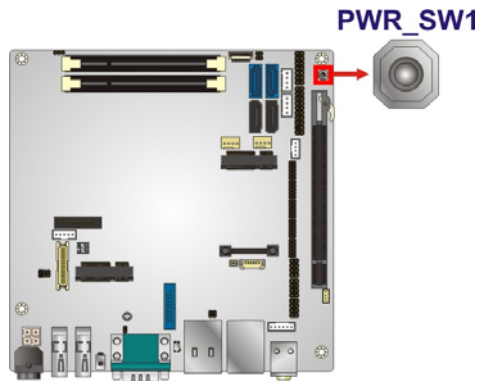
Pin	Description	Pin	Description	Pin	Description	Pin	Description
B8	+3.3v	B29	GND	B50	HSOp(8)	B71	HSOn(13)
B9	JTAG1	B30	RSVD	B51	HSOn(8)	B72	GND
B10	3.3 Vaux	B31	PRSNT#2	B52	GND	B73	GND
B11	WAKE#	B32	GND	B53	GND	B74	HSOp(14)
B12	RSVD	B33	HSOp(4)	B54	HSOp(9)	B75	HSOn(14)
B13	GND	B34	HSOn(4)	B55	HSOn(9)	B76	GND
B14	HSOp(0)	B35	GND	B56	GND	B77	GND
B15	HSOn(0)	B36	GND	B57	GND	B78	HSOp(15)
B16	GND	B37	HSOp(5)	B58	HSOp(10)	B79	HSOn(15)
B17	PRSNT#2	B38	HSOn(5)	B59	HSOn(10)	B80	GND
B18	GND	B39	GND	B60	GND	B81	PRSNT#2
B19	HSOp(1)	B40	GND	B61	GND	B82	RSVD#2
B20	HSOn(1)	B41	HSOp(6)	B62	HSOp(11)		
B21	GND	B42	HSOn(6)	B63	HSOn(11)		

**Table 3-19: PCIe x16 Side B Pinouts**

**3.2.18 Power Button (On-board)**

- CN Label:**
**PWR\_SW1**
- CN Type:**
Push button
- CN Location:**
See **Figure 3-19**

Push the on-board power button to power on the KINO-DQM871-i1.



**Figure 3-19: On-board Power Button Location**

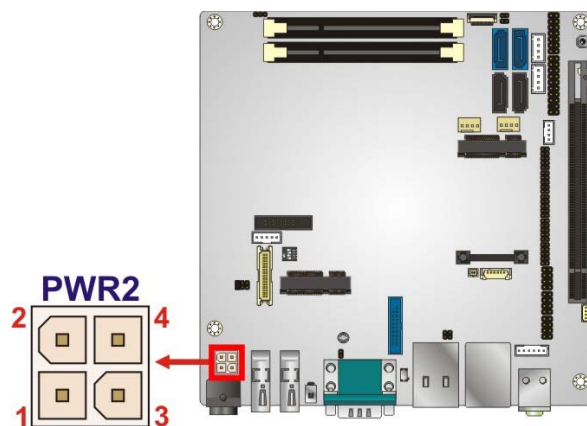


## KINO-DQM871-i1 Mini-ITX SBC

## 3.2.19 Power Connector (12V)

<b>CN Label:</b>	<b>PWR2</b>
<b>CN Type:</b>	4-pin connector
<b>CN Location:</b>	See <b>Figure 3-20</b>
<b>CN Pinouts:</b>	See <b>Table 3-20</b>

The power connector is connected to an external power supply and supports 12V power input. Power is provided to the system, from the power supply through this connector.



**Figure 3-20: Power Connector Location**

Pin	Description	Pin	Description
1	Ground	2	Ground
3	+12V	4	+12V

**Table 3-20: Power Connector Pinouts**

## 3.2.20 RS-232 Serial Port Connectors (COM2 ~ COM5)

<b>CN Label:</b>	<b>COM2, COM3, COM4, COM5</b>
<b>CN Type:</b>	10-pin header
<b>CN Location:</b>	See <b>Figure 3-21</b>
<b>CN Pinouts:</b>	See <b>Table 3-21, Table 3-22, Table 3-23, Table 3-24</b>

Each 10-pin serial port connector provides one RS-232 serial communications channel. The COM serial port connector can be connected to an external RS-232 serial port device.

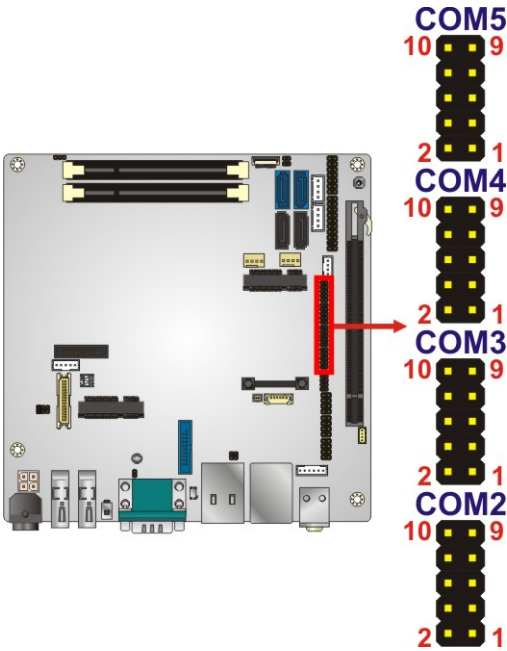


Figure 3-21: RS-232 Serial Port Connector Location

Pin	Description	Pin	Description
1	-NDCD2	2	-NDSR2
3	NSIN2	4	-NRTS2
5	NSOUT2	6	-NCTS2
7	-NDTR2	8	-XRI2
9	GND	10	GND

Table 3-21: COM2 Pinouts

Pin	Description	Pin	Description
1	-NDCD3	2	-NDSR3
3	NSIN3	4	-NRTS3
5	NSOUT3	6	-NCTS3
7	-NDTR3	8	-XRI3
9	GND	10	GND

Table 3-22: COM3 Pinouts

**KINO-DQM871-i1 Mini-ITX SBC**

Pin	Description	Pin	Description
1	-NDCD4	2	-NDSR4
3	NSIN4	4	-NRTS4
5	NSOUT4	6	-NCTS4
7	-NDTR4	8	-XRI4
9	GND	10	GND

**Table 3-23: COM4 Pinouts**

Pin	Description	Pin	Description
1	-NDCD5	2	-NDSR5
3	NSIN5	4	-NRTS5
5	NSOUT5	6	-NCTS5
7	-NDTR5	8	-XRI5
9	GND	10	GND

**Table 3-24: COM5 Pinouts****3.2.21 RS-422/485 Serial Port Connector (COM6)**

**CN Label:** COM6

**CN Type:** 4-pin wafer

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

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

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

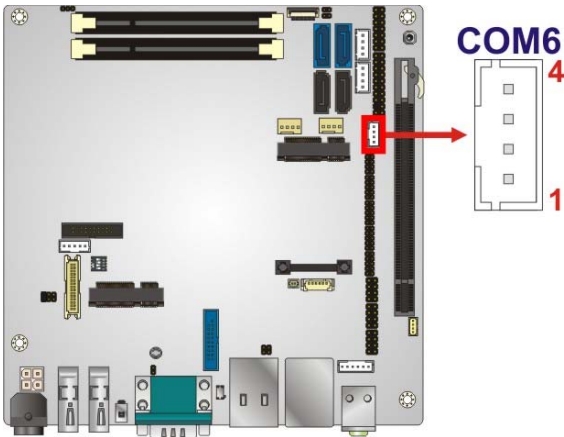


Figure 3-22: RS-422/485 Serial Port Connector Location

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

Table 3-25: RS-422/485 Serial Port Connector Pinouts

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

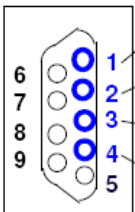
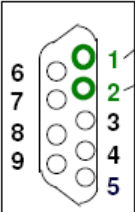
RS-422 Pinouts	RS-485 Pinouts
 <p>TX- (TXD485#) TX+ (TXD485+) RX+ (RXD485+) RX- (RXD485#) RX- (RXD485#)</p>	 <p>TX- (TXD485#) TX+ (TXD485+)</p>

Table 3-26: D-sub 9 RS-422/485 Pinouts

3.2.22 SATA 6Gb/s Drive Connectors

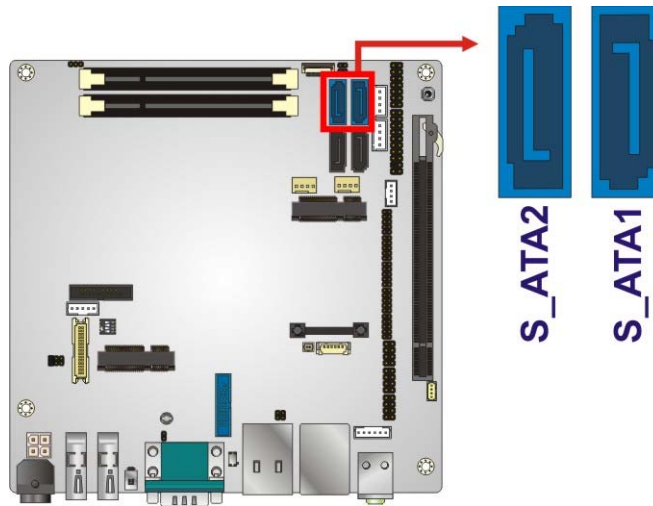
- CN Label: S\_ATA1, S\_ATA2
- CN Type: 7-pin SATA drive connectors

## KINO-DQM871-i1 Mini-ITX SBC

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

**CN Pinouts:** See Table 3-27

The SATA connectors connect to SATA hard drives or optical drives with data transfer speeds as high as 6Gb/s.



**Figure 3-23: SATA 6Gb/s Drive Connector Locations**

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

**Table 3-27: SATA 6Gb/s Drive Connector Pinouts**

### 3.2.23 SATA 3Gb/s Drive Connectors

**CN Label:** S\_ATA3, S\_ATA4

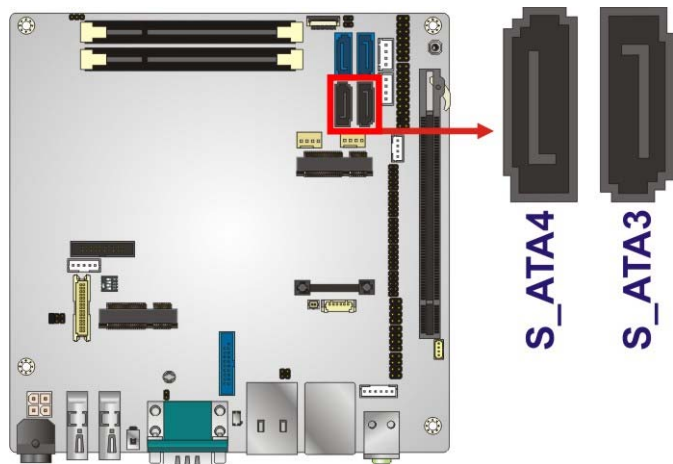
**CN Type:** 7-pin SATA drive connectors

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



**CN Pinouts:** See **Table 3-28**

The SATA connectors connect to SATA hard drives or optical drives with data transfer speeds as high as 3Gb/s.



**Figure 3-24: SATA 3Gb/s Drive Connector Locations**

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

**Table 3-28: SATA 3Gb/s Drive Connector Pinouts**

**3.2.24 SATA Power Connectors**

- CN Label:

SATA\_PWR1, SATA\_PWR2
- CN Type:

4-pin wafer
- CN Location:

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

See **Table 3-29**

## KINO-DQM871-i1 Mini-ITX SBC

Use the SATA Power Connector to connect to SATA device power connections.

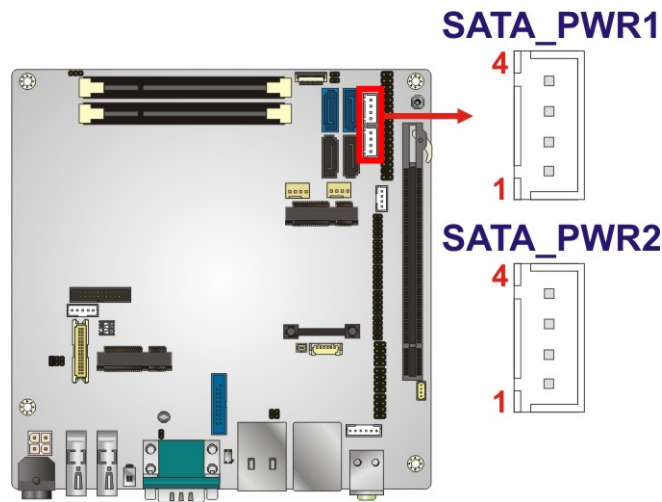


Figure 3-25: SATA Power Connector Locations

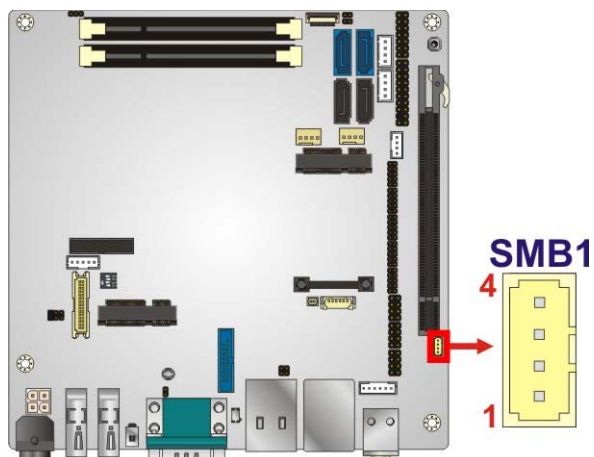
Pin	Description
1	+V12S
2	GND
3	GND
4	+V5S

Table 3-29: SATA Power Connector Pinouts

### 3.2.25 SMBus Connector

<b>CN Label:</b>	<b>SMB1</b>
<b>CN Type:</b>	4-pin wafer
<b>CN Location:</b>	See <b>Figure 3-26</b>
<b>CN Pinouts:</b>	See <b>Table 3-30</b>

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



**Figure 3-26: SMBus Connector Location**

Pin	Description
1	GND
2	SMB_DATA
3	SMB_CLK
4	+V5S

**Table 3-30: SMBus Connector Pinouts**

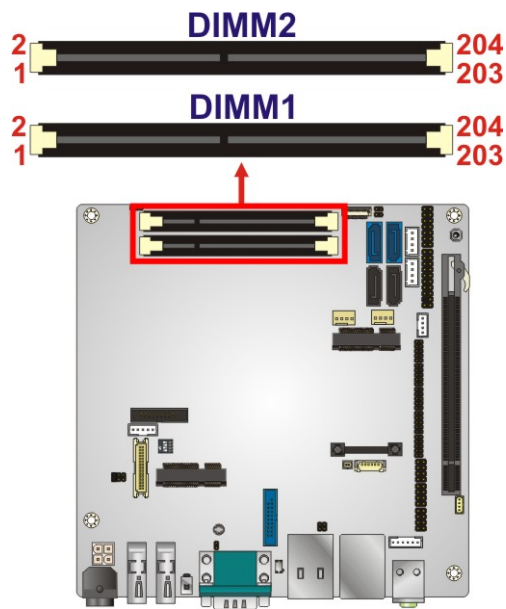
### 3.2.26 SO-DIMM Connectors

**CN Label:** DIMM1, DIMM2

**CN Type:** 204-pin DDR3 SO-DIMM connector

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

The SO-DIMM connector is for installing memory on the system.

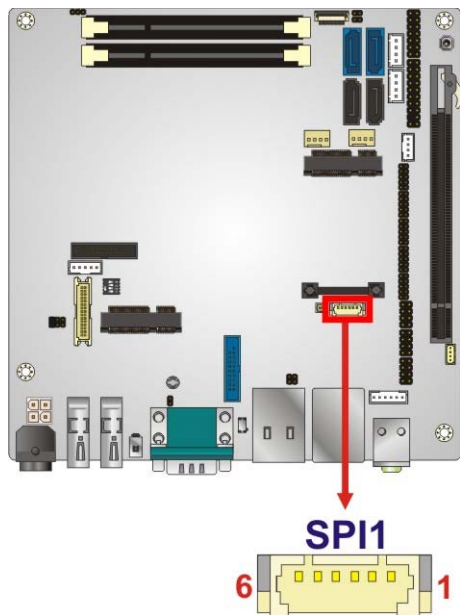
**KINO-DQM871-i1 Mini-ITX SBC**

**Figure 3-27: SO-DIMM Connector Locations**

### 3.2.27 SPI Flash Connector

<b>CN Label:</b>	<b>SPI1</b>
<b>CN Type:</b>	6-pin wafer
<b>CN Location:</b>	See <b>Figure 3-28</b>
<b>CN Pinouts:</b>	See <b>Table 3-31</b>

The 6-pin SPI Flash connector is used to flash the BIOS.



**Figure 3-28: SPI Flash Connector Location**

Pin	Description
1	+V3.3M_SPI_CON
2	SPI_CS0_N
3	SPI_SO
4	SPI_CLK
5	SPI_SI
6	GND

**Table 3-31: SPI Flash Connector Pinouts**

### 3.2.28 SPI Flash Connector (EC)

**CN Label:** CN2

**CN Type:** 2-pin header

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

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

The 2-pin EC SPI Flash connector is used to flash the embedded controller (EC).



## KINO-DQM871-i1 Mini-ITX SBC

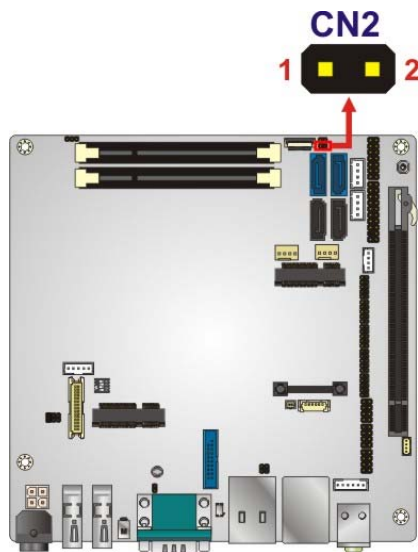


Figure 3-29: EC SPI Flash Connector Location

Pin	Description
1	SMCLK1_EC
2	SMDAT1_EC

Table 3-32: EC SPI Flash Connector Pinouts

## 3.2.29 TPM Connector

<b>CN Label:</b>	<b>TPM1</b>
<b>CN Type:</b>	20-pin header
<b>CN Location:</b>	See <b>Figure 3-30</b>
<b>CN Pinouts:</b>	See <b>Table 3-33</b>

The Trusted Platform Module (TPM) connector secures the system on bootup.

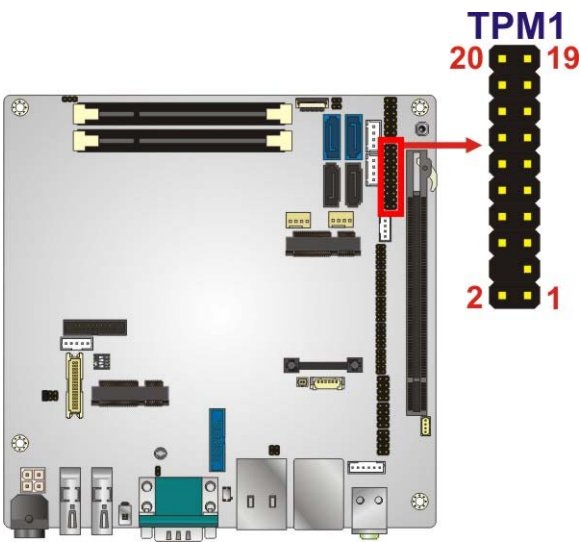


Figure 3-30: TPM Connector Location

Pin	Description	Pin	Description
1	CLK_PCI_TPM	2	GND
3	LPC_FRAME#	4	N/C
5	BUF_PLT_RST#	6	+5V
7	LPC_AD3	8	LPC_AD2
9	+3.3V	10	LPC_AD1
11	LPC_AD0	12	GND
13	SMB_CLK	14	SMB_DATA
15	SB3V	16	INT_SERIRQ
17	GND	18	PM_CLKRUN#
19	SB3V	20	TPM_DRQ#0

Table 3-33: TPM Connector Pinouts

### 3.2.30 USB 2.0 Connectors

- CN Label: USB1, USB2, USB3
- CN Type: 8-pin header
- CN Location: See Figure 3-31
- CN Pinouts: See Table 3-34, Table 3-35, Table 3-36

## KINO-DQM871-i1 Mini-ITX SBC

Each USB header can connect to two USB devices.

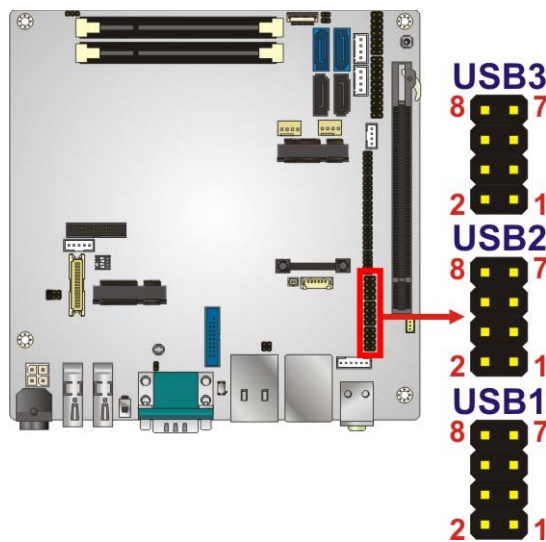


Figure 3-31: USB 2.0 Connector Locations

Pin	Description	Pin	Description
1	VCC	2	GND
3	DATA4-	4	DATA5+
5	DATA4+	6	DATA5-
7	GND	8	VCC

Table 3-34: USB1 Pinouts

Pin	Description	Pin	Description
1	VCC	2	GND
3	DATA6-	4	DATA7+
5	DATA6+	6	DATA7-
7	GND	8	VCC

Table 3-35: USB2 Pinouts

Pin	Description	Pin	Description
1	VCC	2	GND
3	DATA8-	4	DATA9+

Pin	Description	Pin	Description
5	DATA8+	6	DATA9-
7	GND	8	VCC

Table 3-36: USB3 Pinouts

3.2.31 USB 3.0 Connector

- CN Label:** CN1
- CN Type:** 20-pin box header
- CN Location:** See **Figure 3-32**
- CN Pinouts:** See **Table 3-37**

The connector supports two USB 3.0 connections.

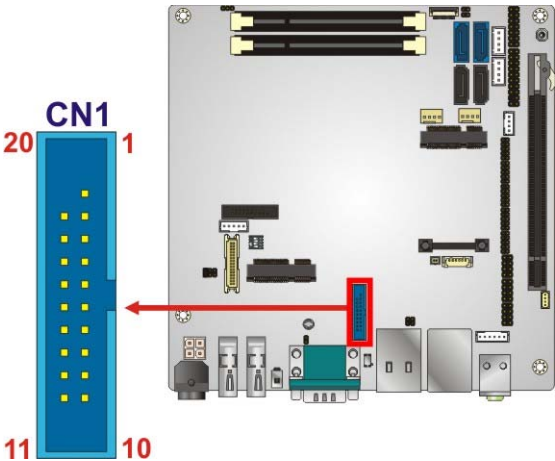


Figure 3-32: USB 3.0 Connector Location

Pin	Description	Pin	Description
1	+5V	11	USB2_DP2
2	USB3_RXDN5_C	12	USB2_DN2
3	USB3_RXDP5_C	13	GND
4	GND	14	USB3_TXDP4_C
5	USB3_TXDN5_C	15	USB3_TXDN4_C
6	USB3_TXDP5_C	16	GND
7	GND	17	USB3_RXDP4_C

## KINO-DQM871-i1 Mini-ITX SBC

Pin	Description	Pin	Description
8	USB2_DN3	18	USB3_RXDN4_C
9	USB2_DP3	19	+5V
10	NC	20	NC

Table 3-37: USB 3.0 Connector Pinouts

### 3.3 External Interface Connectors

Figure 3-33 shows the KINO-DQM871-i1 motherboard external interface connectors. The KINO-DQM871-i1 on-board external interface connectors are shown in **Figure 3-33**.

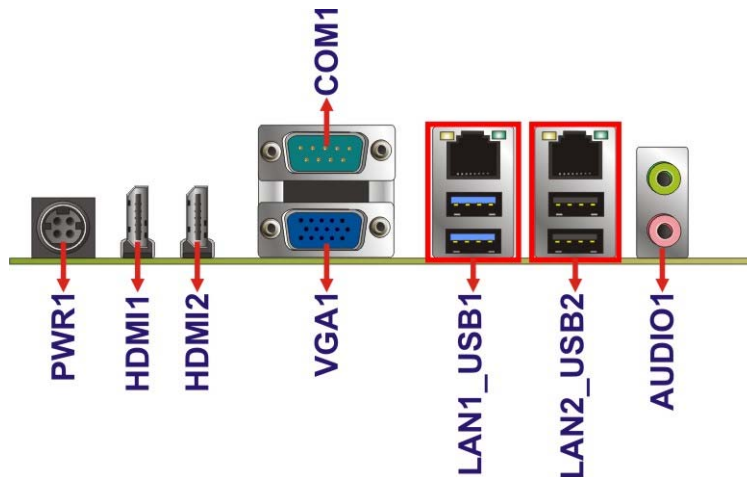


Figure 3-33: External Interface Connectors

#### 3.3.1 Audio Connector

**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 3-34: Audio Jacks

### 3.3.2 Ethernet and USB 2.0 Connectors

- CN Label:** LAN2\_USB2
- CN Type:** RJ-45 and USB 2.0 combo connector
- CN Location:** See **Figure 3-33**
- CN Pinouts:** See **Table 3-38** and **Table 3-40**

The LAN connector connects to a local network. The LAN2 connector supports IPMI 2.0.

Pin	Description	Pin	Description
1	TRD0+	5	TRD2+
2	TRD0-	6	TRD2-
3	TRD1+	7	TRD3+
4	TRD1-	8	TRD3-

Table 3-38: LAN2 Pinouts

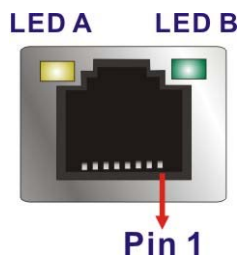


Figure 3-35: Ethernet Connector

**KINO-DQM871-i1 Mini-ITX SBC**

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 3-39: Connector LEDs**

Each USB 2.0 connector can be connected to a USB device.

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

**Table 3-40: External USB 2.0 Port Pinouts****3.3.3 Ethernet and USB 3.0 Connectors**

**CN Label:** LAN1\_USB1

**CN Type:** RJ-45 and USB 3.0 combo connector

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

**CN Pinouts:** See **Table 3-41** and **Table 3-43**

The LAN connector connects to a local network. The LAN1 connector supports Intel® AMT 9.0.

Pin	Description	Pin	Description
1	MDI0+	5	MDI2+
2	MDI0-	6	MDI2-
3	MDI1+	7	MDI3+
4	MDI1-	8	MDI3-

**Table 3-41: LAN1 Pinouts**

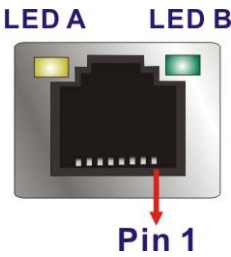


Figure 3-36: Ethernet Connector

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 3-42: Connector LEDs

Each USB 3.0 connector can be connected to a USB device.

Pin	Description
1	VBUS
2	D1-
3	D1+
4	GND1
5	STDA_SSRX1_N
6	STDA_SSRX1_P
7	GND_DRAIN
8	STDA_SSTX1_N
9	STDA_SSTX1_P

Table 3-43: External USB 3.0 Port Pinouts

3.3.4 HDMI Connectors

- CN Label:

HDMI1, HDMI2
- CN Type:

HDMI connector
- CN Location:

See Figure 3-33

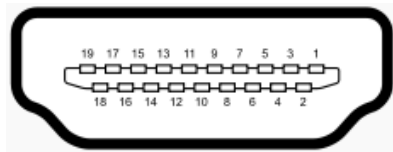
**KINO-DQM871-i1 Mini-ITX SBC**

**CN Pinouts:** See **Table 3-44** and **Figure 3-37**

The HDMI connector connects to a display device with HDMI interface.

Pin	Description	Pin	Description
1	HDMI_DATA2	11	GND
2	GND	12	HDMI_CLK#
3	HDMI_DATA2#	13	N/C
4	HDMI_DATA1	14	N/C
5	GND	15	HDMI_SCL
6	HDMI_DATA1#	16	HDMI_SDA
7	HDMI_DATA0	17	GND
8	GND	18	+5V
9	HDMI_DATA0#	19	HDMI_HPD
10	HDMI_CLK+		

**Table 3-44: HDMI Connector Pinouts**

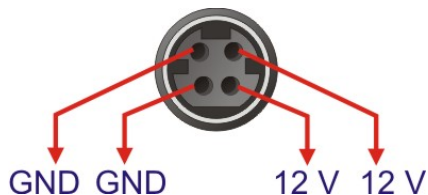


**Figure 3-37: HDMI Connector**

### 3.3.5 Power Connector (12 V, Power Adapter)

**CN Label:** PWR1  
**CN Type:** 4-pin Mini-DIN  
**CN Location:** See **Figure 3-33**  
**CN Pinouts:** See **Figure 3-38**

The connector supports a 12V power adapter.



**Figure 3-38: 4-pin Power Mini-DIN Connection**

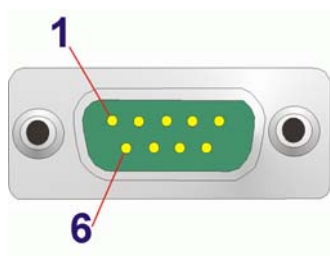
### 3.3.6 Serial Port Connector (COM1)

**CN Label:** COM1  
**CN Type:** D-sub 9  
**CN Location:** See **Figure 3-33**  
**CN Pinouts:** See **Table 3-45**

The serial port connects to a RS-232 serial communications 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 3-45: Serial Port Pinouts**



**Figure 3-39: Serial Port Pinouts**

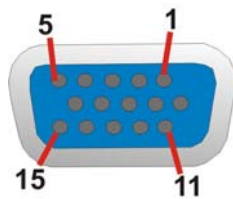


## KINO-DQM871-i1 Mini-ITX SBC

## 3.3.7 VGA Connector

- CN Label:** VGA1
- CN Type:** 15-pin Female
- CN Location:** See **Figure 3-33**
- CN Pinouts:** See **Figure 3-40** and **Table 3-46**

Use the VGA connector to connect to a monitor that accepts a standard VGA input.



**Figure 3-40: VGA Connector**

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

**Table 3-46: VGA Connector Pinouts**

**Chapter**

**4**

# **Installation**

---

## KINO-DQM871-i1 Mini-ITX SBC

### 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 KINO-DQM871-i1. Dry climates are especially susceptible to ESD. It is therefore critical to strictly adhere to the following anti-static precautions whenever the KINO-DQM871-i1, 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 KINO-DQM871-i1, place it on an anti-static pad. This reduces the possibility of ESD damaging the KINO-DQM871-i1.
- ***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 KINO-DQM871-i1 is installed. All installation notices pertaining to the installation of KINO-DQM871-i1 should be strictly adhered to. Failing to adhere to these precautions may lead to severe damage of the KINO-DQM871-i1 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 KINO-DQM871-i1, KINO-DQM871-i1 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 antistatic pad:**
  - When installing or configuring the motherboard, place it on an antistatic 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 KINO-DQM871-i1 **DO NOT:**

- **DO NOT** remove any of the stickers on the PCB board. These stickers are required for warranty validation.
- **DO NOT** use the product before verifying all the cables and power connectors are properly connected.
- **DO NOT** allow screws to come in contact with the PCB circuit, connector pins, or its components.

## KINO-DQM871-i1 Mini-ITX SBC

## 4.3 Cooling Kit Installation

An IEI CPU cooling kit can be purchased separately (See **Chapter 2**). The cooling kit is comprised of a CPU heat sink and a cooling fan.

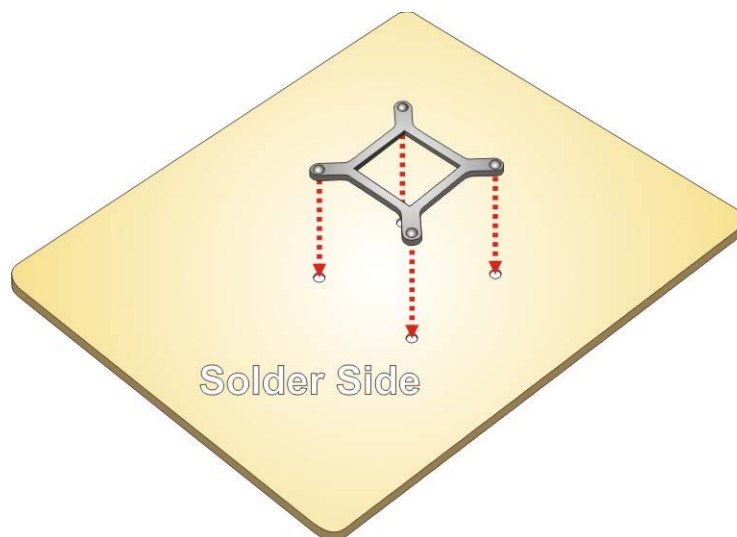
**WARNING:**

Do not wipe off (accidentally or otherwise) the pre-sprayed layer of thermal paste on the bottom of the heat sink. The thermal paste between the CPU and the heat sink is important for optimum heat dissipation.

---

To install the cooling kit, please follow the steps below.

**Step 1: Install the support bracket.** Remove the tape from the support bracket. From the solder side of the board, align the support bracket to the holes on board and stick in place.

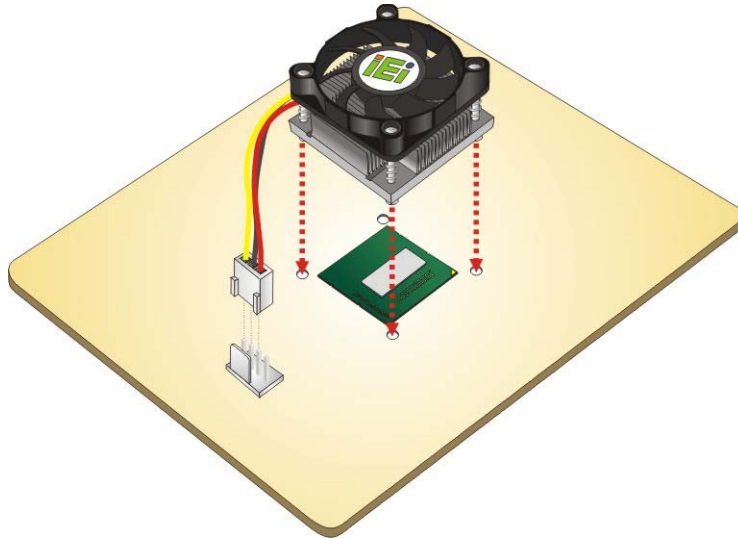


**Figure 4-1: Install Support Bracket**



**Step 2: Properly orient the cooling kit.** The CPU fan cable must not interfere with the fan or other moving parts. Make sure the cable can be routed away from the moving parts.

**Step 3: Properly align the cooling kit.** Line up the four screws with the screw holes on the support bracket below the board (**Figure 4-2**).



**Figure 4-2: Align the Cooling Kit**

**Step 4: Place the cooling kit onto the CPU.** Push down the fan with some pressure to secure the cooling kit with the support bracket. See **Figure 4-3**.

**Step 5: Tighten the screws.** Use a screwdriver to tighten the four screws. In a diagonal pattern, tighten each screw a few turns then move to the next one, until they are all secured. Do not overtighten the screws. See **Figure 4-3**.

**Step 6: Connect the fan cable.** Connect the cooling kit fan cable to the fan connector on the board. Carefully route the cable away from heat generating chips and fan blades.

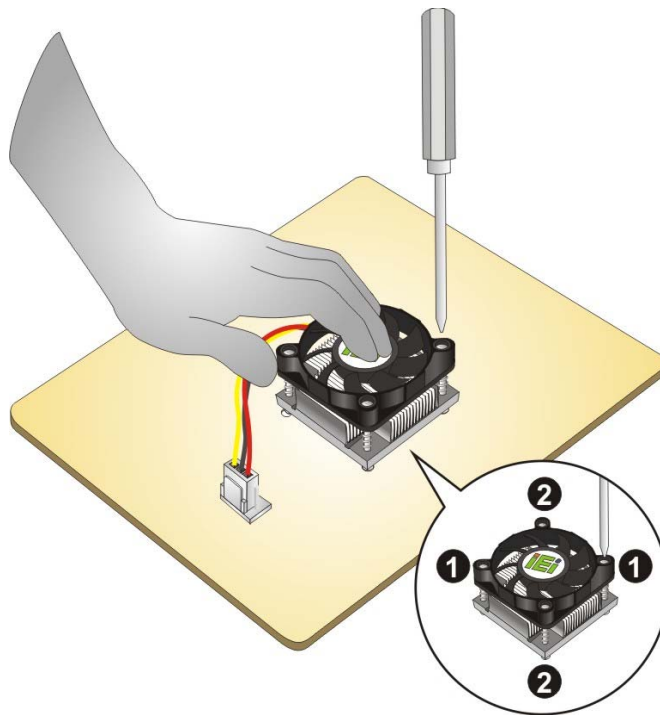
**KINO-DQM871-i1 Mini-ITX SBC**

Figure 4-3: Secure the Cooling Kit

## 4.4 SO-DIMM Installation

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

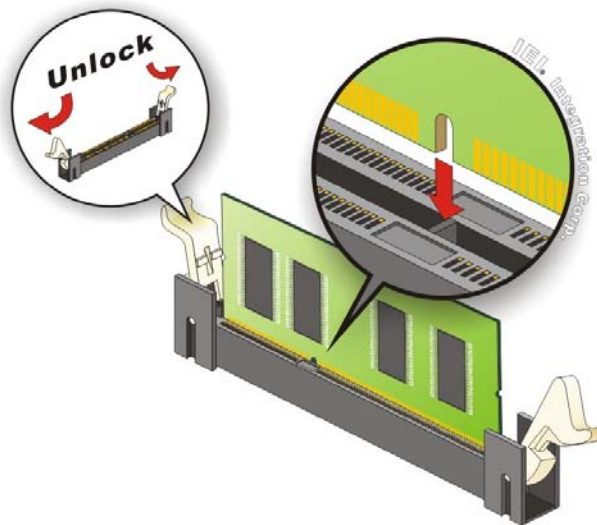


Figure 4-4: SO-DIMM Installation

- Step 1: Open the SO-DIMM socket handles.** Open the two handles outwards as far as they can. See **Figure 4-4**.
- Step 2: Align the SO-DIMM with the socket.** Align the SO-DIMM so the notch on the memory lines up with the notch on the memory socket. See **Figure 4-4**.
- Step 3: Insert the SO-DIMM.** Once aligned, press down until the SO-DIMM is properly seated. Clip the two handles into place. See **Figure 4-4**.
- Step 4: Removing a SO-DIMM.** To remove a SO-DIMM, push both handles outward. The memory module is ejected by a mechanism in the socket.

## 4.5 iRIS-1010 Module Installation



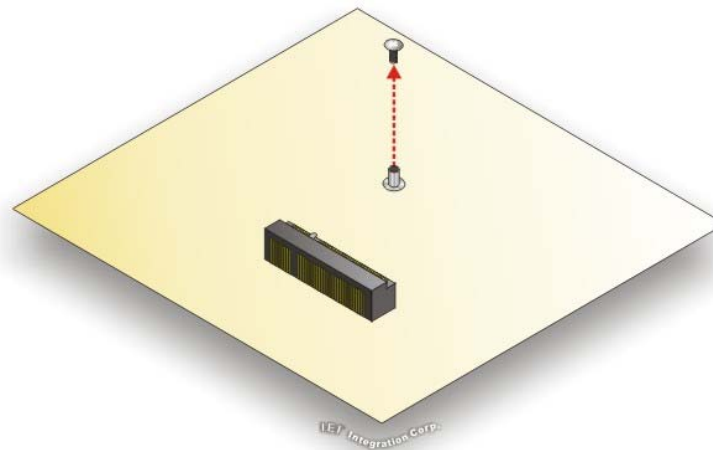
### WARNING:

The iRIS module slot is designed to install the IEI iRIS-1010 IPMI 2.0 module only. DO NOT install other modules into the iRIS module slot. Doing so may cause damage to the KINO-DQM871-i1.

To install the iRIS-1010 module, please follow the steps below and refer to **Figure 4-6**.

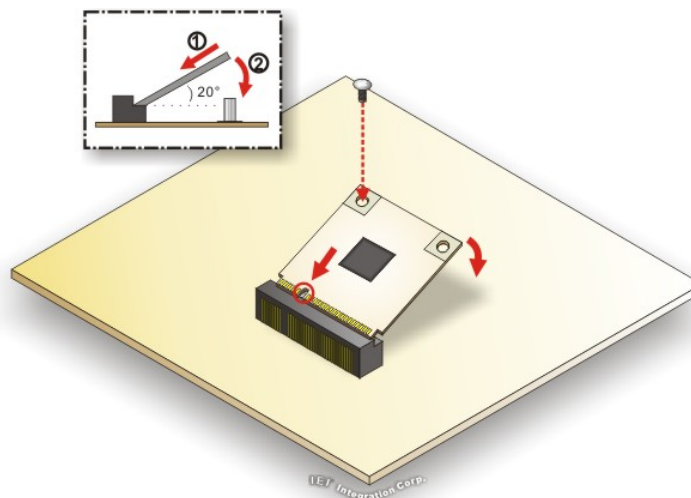
- Step 1: Locate the iRIS module slot on the KINO-DQM871-i1.** See **Figure 3-11**.
- Step 2: Remove the preinstalled retention screw** on the screw pillar of the iRIS module slot as shown in **Figure 4-5**.

## KINO-DQM871-i1 Mini-ITX SBC

**Figure 4-5: iRIS-1010 Module Installation**

**Step 3:** Insert into the socket at an angle. Line up the notch on the iRIS-1010 module with the notch on the connector. Slide the iRIS-1010 module into the socket at an angle of about 20°.

**Step 4:** Secure the iRIS-1010 module with the retention screw. Push the other end of the iRIS-1010 module down and secure the module with the previously removed retention screw.

**Figure 4-6: iRIS-1010 Module Installation**

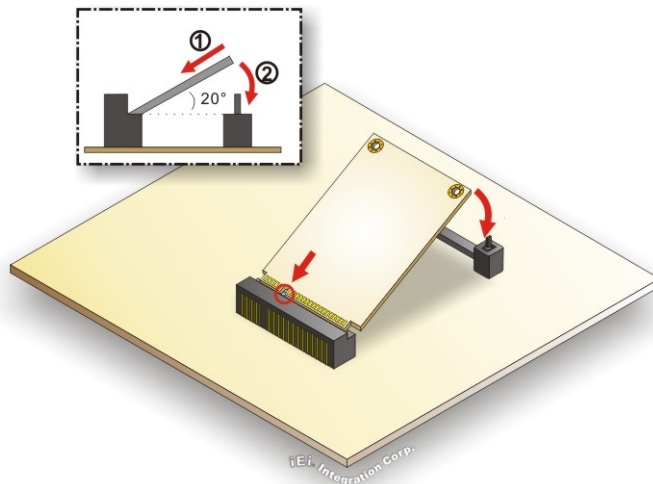


**NOTE:**

After installing the iRIS-1010 module, use **LAN1** port to establish a network connection. Please refer to **Section 4.10** for IPMI setup procedures.

## 4.6 PCIe Mini Card Installation

Two PCIe Mini card slots are located on the KINO-DQM871-i1. To install the PCIe Mini card, please refer to the diagram and instructions below.



**Figure 4-7: PCIe Mini Card Installation**

- Step 1:** Insert into the socket at an angle. Line up the notch on the card with the notch on the connector. Slide the PCIe Mini card into the socket at an angle of about 20°.
- Step 2:** Push down until the card clips into place. Push the other end of the card down until it clips into place on the plastic connector.

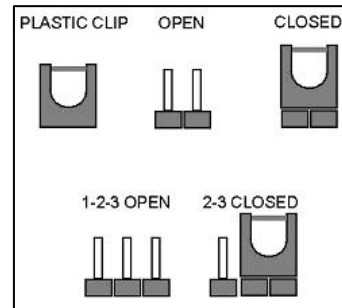


## KINO-DQM871-i1 Mini-ITX SBC

## 4.7 Jumper Settings

**NOTE:**

A jumper is a metal bridge that is used to close an electrical circuit. It consists of two metal pins and a small metal clip (often protected by a plastic cover) that slides over the pins to connect them. To CLOSE/SHORT a jumper means connecting the pins of the jumper with the plastic clip and to OPEN a jumper means removing the plastic clip from a jumper.



Before the KINO-DQM871-i1 is installed in the system, the jumpers must be set in accordance with the desired configuration. The jumpers on the KINO-DQM871-i1 are listed in Table 4-1.

Description	Label	Type
AT/ATX mode selection	J_ATXCTL1	Switch
Clear CMOS	J_CMOS1	Push-button
LVDS voltage selection	JLCD_PWR1	6-pin header
LVDS resolution selection	SW1	DIP switch

**Table 4-1: Jumpers**

## 4.7.1 AT/ATX Mode Selection

**Jumper Label:** J\_ATXCTL1  
**Jumper Type:** Switch  
**Jumper Settings:** See Figure 4-8  
**Jumper Location:** See Figure 4-8

Set the switch to select AT or ATX power mode for the KINO-DQM871-i1. AT power mode limits the system to on/off. ATX allows the system to use various power saving states and enter a standby state, so the system can be turned on remotely over a network. To configure, see the diagram below. The default setting is ATX power mode.

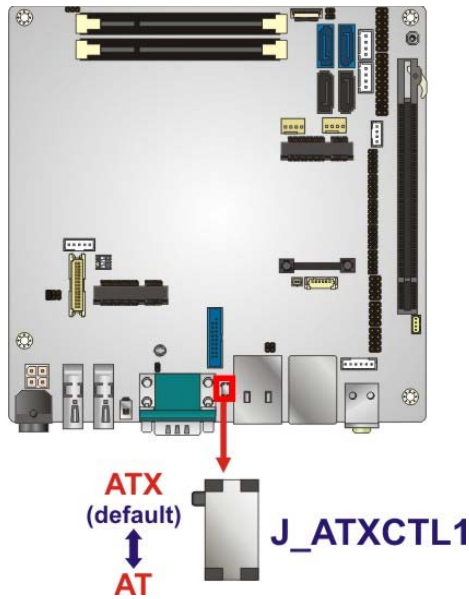


Figure 4-8: AT/ATX Mode Selection Jumper Location

#### 4.7.2 Clear CMOS

<b>Jumper Label:</b>	<b>J_CMOS1</b>
<b>Jumper Type:</b>	Push button
<b>Jumper Location:</b>	See <b>Figure 4-9</b>

If the KINO-DQM871-i1 fails to boot due to improper BIOS settings, the clear CMOS jumper clears the CMOS data and resets the system BIOS information. To do this, push the clear CMOS button for three seconds, then restart the system.

If the “CMOS Settings Wrong” message is displayed during the boot up process, the fault may be corrected by pressing the F1 to enter the CMOS Setup menu. Do one of the following:

- Enter the correct CMOS setting
- Load Optimal Defaults

## KINO-DQM871-i1 Mini-ITX SBC

- Load Failsafe Defaults.

After having done one of the above, save the changes and exit the CMOS Setup menu.

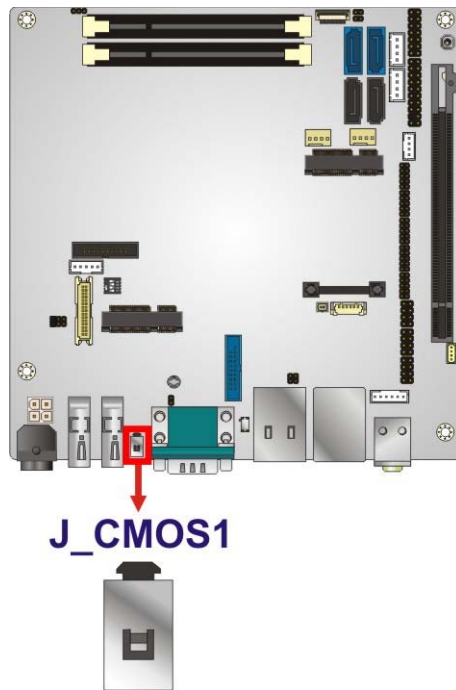


Figure 4-9: Clear CMOS Jumper Location

### 4.7.3 LVDS Voltage Selection

<b>Jumper Label:</b>	JLCD_PWR1
<b>Jumper Type:</b>	6-pin header
<b>Jumper Settings:</b>	See Table 4-2
<b>Jumper Location:</b>	See Figure 4-10

This jumper selects the voltage of the LVDS connector.

Pin	Description
Short 1-2	+3.3 V (Default)
Short 3-4	+5 V
Short 5-6	+12 V

Table 4-2: LVDS Voltage Selection Jumper Settings

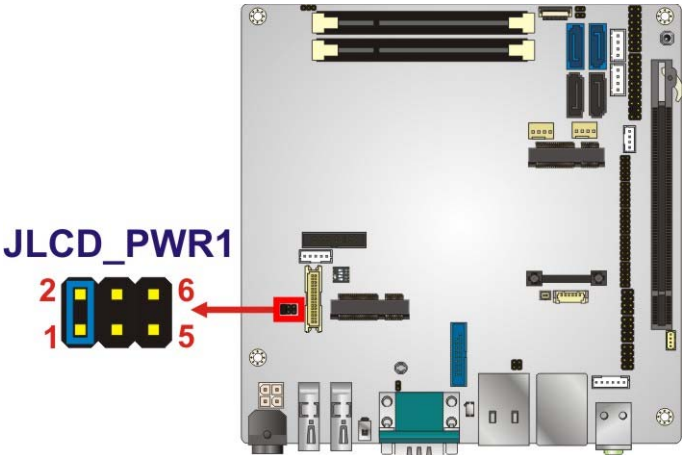


Figure 4-10: LVDS Voltage Selection Jumper Location

4.7.4 LVDS Resolution Selection

- Jumper Label:

SW1
- Jumper Type:

DIP switch
- Jumper Settings:

See Table 4-3
- Jumper Location:

See Figure 4-11

This jumper selects the resolution of the LCD panel connected to the LVDS connector.

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

SW1 (4-3-2-1)	Description
0000	800x600 18bit S (default)
0001	1024x768 18bit S
0010	1024x768 24bit S
0011	1280x768 18bit S
0100	1280x800 18bit S
0101	1280x960 18bit S
0110	1280x1024 24bit D
0111	1366x768 18bit S
1000	1366x768 24bit S
1001	1440x960 24bit D

## KINO-DQM871-i1 Mini-ITX SBC

SW1 (4-3-2-1)	Description
1010	1400x1050 24bit D
1011	1600x900 24bit D
1100	1680x1050 24bit D
1101	1600x1200 24bit D
1110	1920x1080 24bit D
1111	1920x1200 24bit D

Table 4-3: LVDS Resolution Selection Jumper Settings

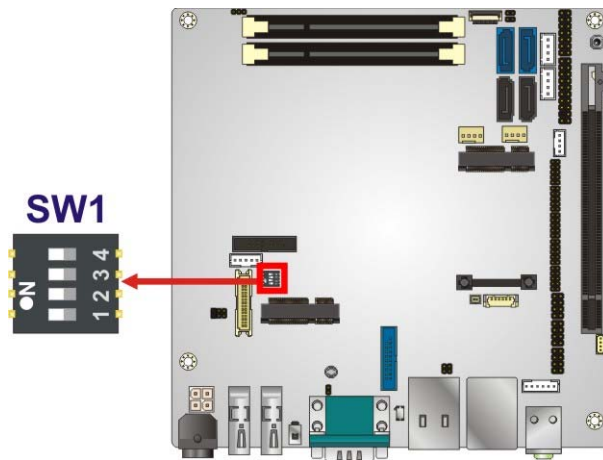


Figure 4-11: LVDS Resolution Selection Jumper Location

## 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 KINO-DQM871-i1 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 KINO-DQM871-i1 motherboard into the chassis please refer to the reference material that came with the chassis.

### 4.9 Internal Peripheral Device Connections

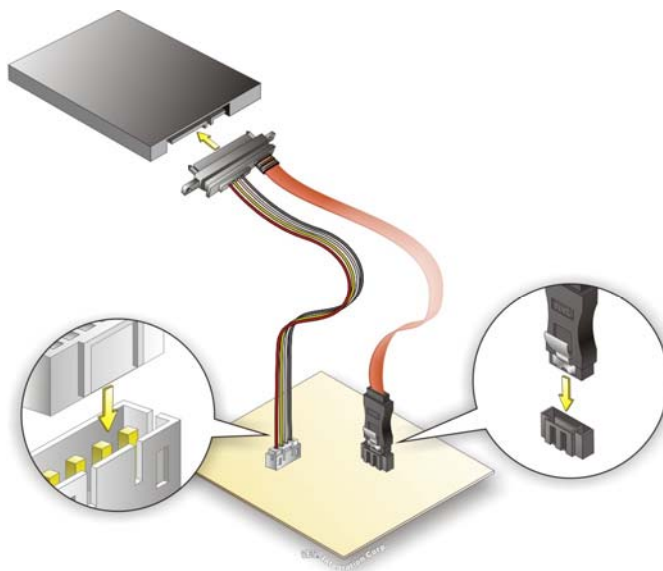
This section outlines the installation of peripheral devices to the onboard connectors.

#### 4.9.1 SATA Drive Connection

The KINO-DQM871-i1 is shipped with two SATA drive cable. 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 4-12**.



**Figure 4-12: SATA Drive Cable Connection**

## KINO-DQM871-i1 Mini-ITX SBC

**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 4-12**.

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

### 4.10 IPMI Setup Procedure

The KINO-DQM871-i1 features Intelligent Platform Management Interface (IPMI) that helps lower the overall costs of server management by enabling users to maximize IT resources, save time and manage multiple systems. The KINO-DQM871-i1 supports IPMI 2.0 through the optional iRIS-1010 module. Follow the steps below to setup IPMI.

The hardware configuration of the managed system (KINO-DQM871-i1) is described below.

**Step 1:** Install an iRIS-1010 module to the IPMI module socket (refer to **Section 4.5**).

**Step 2:** Make sure at least one DDR3 SO-DIMM is installed on the KINO-DQM871-i1.

**Step 3:** Connect an Ethernet cable to the RJ-45 connector labeled **LAN2** (**Figure 3-33**).

### 4.11 Intel® AMT Setup Procedure

The KINO-DQM871-i1 is featured with the Intel® Active Management Technology (AMT). To enable the Intel® AMT function, follow the steps below.

**Step 1:** Make sure at least one DDR3 SO-DIMM is installed on the KINO-DQM871-i1.

**Step 2:** Connect an Ethernet cable to the RJ-45 connector labeled **LAN1**.

**Step 3:** The AMI BIOS options regarding the Intel® ME or Intel® AMT must be enabled,

**Step 4:** Properly install the Intel® Management Engine Components drivers from the iAMT Driver & Utility directory in the driver CD. See **Section 6.8**.

**Step 5:** Configure the Intel® Management Engine BIOS extension (MEBx). To get into the Intel® MEBx settings, press <Ctrl+P> after a single beep during boot-up

process. Enter the Intel® current ME password as it requires (the Intel® default password is **admin**).

**NOTE:**

To change the password, enter a new password following the strong password rule (containing at least one upper case letter, one lower case letter, one digit and one special character, and be at least eight characters).

---

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



## KINO-DQM871-i1 Mini-ITX SBC

Key	Function
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
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 jumper 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.
- Boot – Changes the system boot configuration.
- Security – Sets User and Supervisor Passwords.
- Save & Exit – Selects exit options and loads default settings.

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

## KINO-DQM871-i1 Mini-ITX SBC

## 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) 2012 American Megatrends, Inc.			
Main	Advanced	Chipset	Boot Security Save & Exit
BIOS Information			Set the Date. Use Tab to switch between Date elements.
BIOS Vendor		American Megatrends	
Core Version		4.6.5.4	
Compliance		UEFI 2.3.1; PI 1.2	
Project Version		E435AR10.ROM	
Build Date and Time		05/05/2014 17:55:16	
iWDD Vendor		iEi	
iWDD Version		E435ER12.bin	
Processor Information			
Name		Haswell	
Brand String		Intel(R) Core(TM) i3-	
Frequency		2400 MHz	
Processor ID		306c3	
Stepping		C0	
Number of Processors		2Core(s) / 4Thread(s)	
Microcode Revision		16	
GT Info		GT2 (800 MHz)	
IGFX VBIOS Version		2167	
Memory RC Version		1.6.2.1	
Total Memory		2048 MB (DDR3)	
Memory Frequency		1333 MHz	
PCH Information			
Name		LynxPoint	
PCH SKU		QM87	
Stepping		05/C2	
LAN PHY Revision		A3	-----
ME FW Version		9.0.10.1372	
ME Firmware SKU		5MB	→←: Select Screen
SPI Clock Frequency			↑↓: Select Item
DOFR Support		Unsupported	Enter: Select
Read Status Clock Frequency		50 MHz	+/-: Change Opt.
Write Status Clock Frequency		50 MHz	F1: General Help
Fast Read Status Clock Frequency		50 MHz	F2: Previous Values
System Date		[Tue 12/25/2012]	F3: Optimized Defaults
System Time		[15:10:27]	F4: Save & Exit
Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.			ESC: Exit

## BIOS Menu 1: Main

### → System Overview

The **BIOS Information** lists a brief summary of the BIOS. The fields in **BIOS Information** cannot be changed. The items shown in the system overview include:

- BIOS Information
- Processor Information
- Memory Information
- PCH Information
- SPI Clock Frequency

The System Overview field also 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:

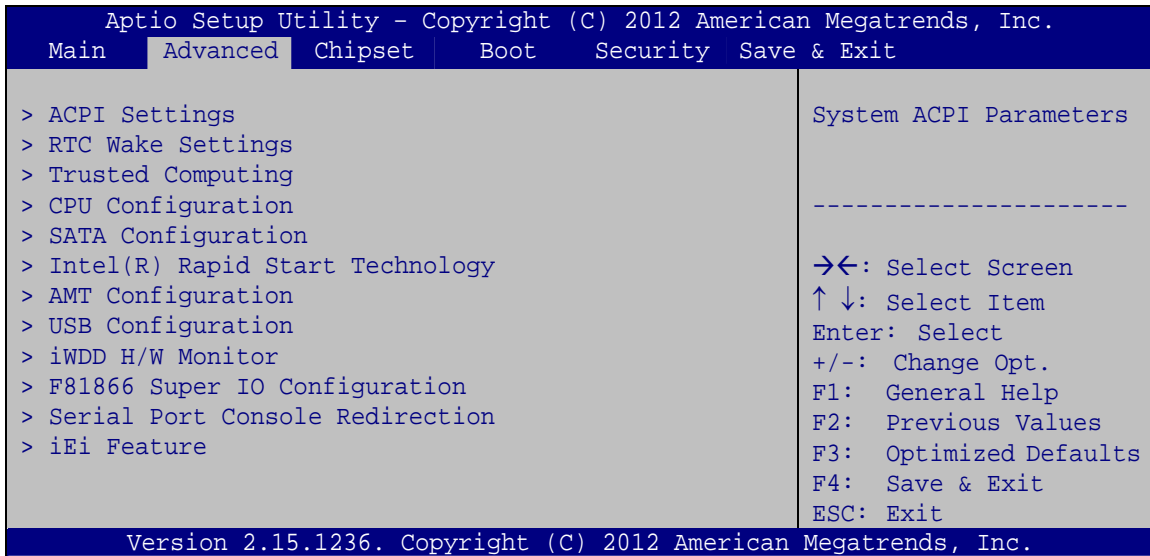


### **WARNING:**

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.

---

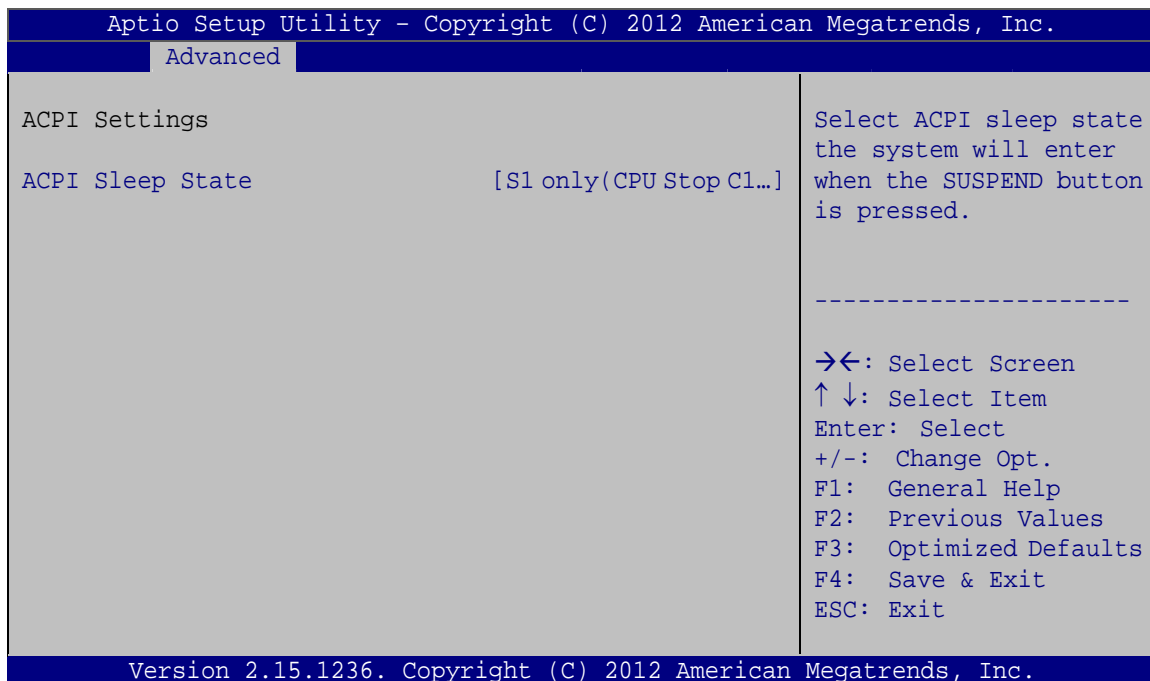
## KINO-DQM871-i1 Mini-ITX SBC



### 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



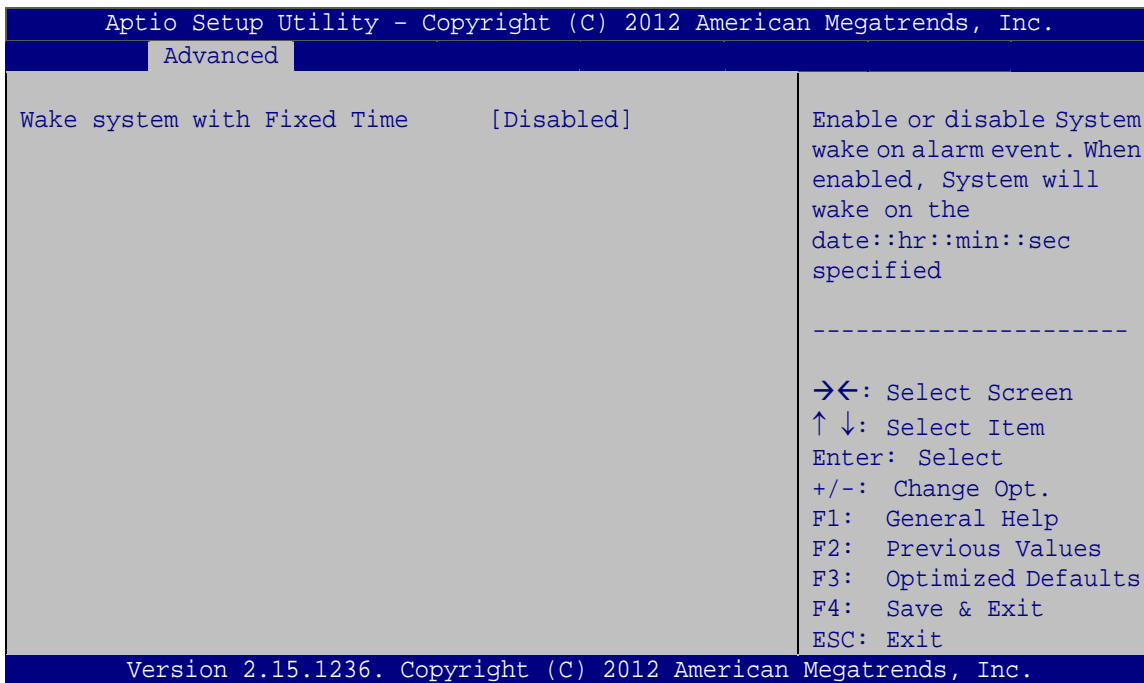
➔ **ACPI Sleep State [S1 only (CPU Stop Clock)]**

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

- |                                   |                |   |
|-----------------------------------|----------------|---|
| ➔ <b>S1 only (CPU Stop Clock)</b> | <b>DEFAULT</b> | The system enters S1 (POS) sleep state. The system appears off. The CPU is stopped; RAM is refreshed; the system is running in a low power mode.            |
| ➔ <b>S3 only (Suspend to RAM)</b> |                | 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 RTC Wake Settings

The **RTC Wake Settings** menu (**BIOS Menu 4**) enables the system to wake at the specified time.



**BIOS Menu 4: RTC Wake Settings**

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→ **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

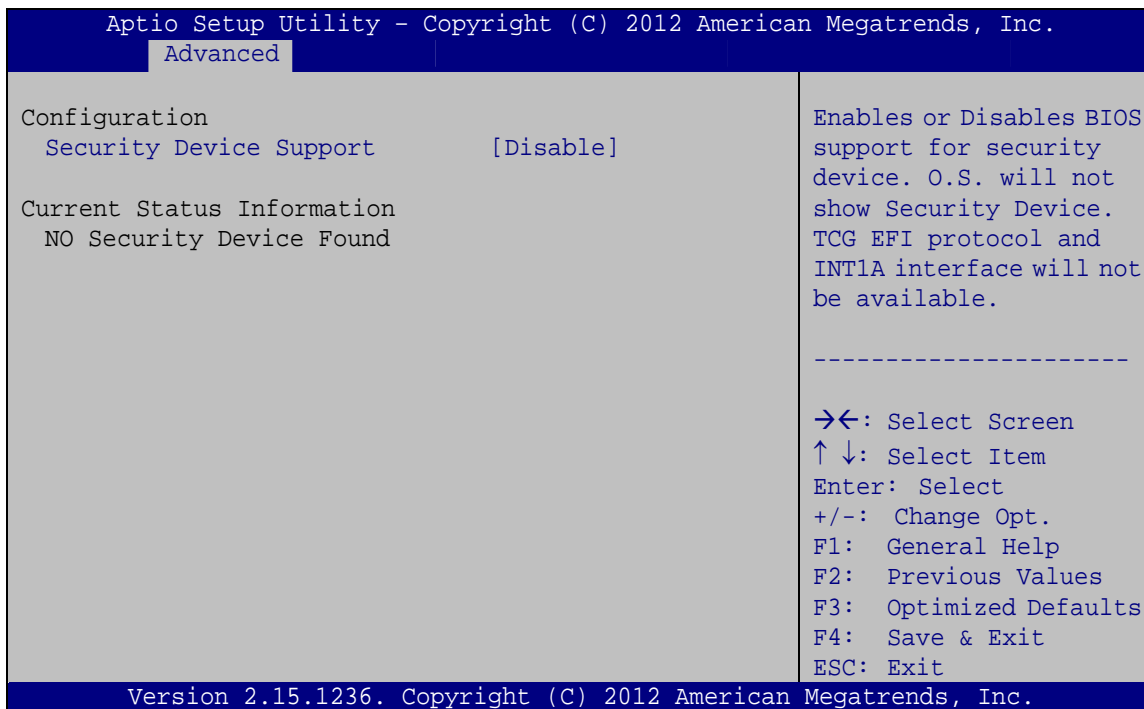
Wake up minute

Wake up second

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

### 5.3.3 Trusted Computing

Use the **Trusted Computing** menu (**BIOS Menu 5**) to configure settings related to the Trusted Computing Group (TCG) Trusted Platform Module (TPM).



## BIOS Menu 5: 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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## 5.3.4 CPU Configuration

Use the **CPU Configuration** menu (**BIOS Menu 6**) to view detailed CPU specifications and configure the CPU.

Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.		
Advanced		
CPU Configuration		Enabled for Windows XP and Linux (OS optimized for Hyper-Threading Technology) and Disabled for other OS (OS not optimized for Hyper-Threading Technology). When Disabled only one thread per enabled core is enabled.
Intel(R) Core(TM) i3-4100E CPU @ 2.40GHz		
CPU Signature	306c3	
Microcode Patch	16	
Max CPU Speed	2400 MHz	
Min CPU Speed	800 MHz	
CPU Speed	2400 MHz	
Processor Cores	2	
Intel HT Technology	Supported	
Intel VT-x Technology	Supported	
Intel SMX Technology	Not Supported	
64-bit	Supported	
EIST Technology	Supported	
L1 Data Cache	32 kB x 2	
L1 Code Cache	32 kB x 2	
L2 Cache	256 kB x 2	
L3 Cache	3072 kB	
Hyper-threading	[Enabled]	
Active Processor Cores	[All]	
Intel Virtualization Technology	[Disabled]	
EIST	[Enabled]	
		-----
		→←: Select Screen
		↑ ↓: Select Item
		Enter: Select
		+/-: Change Opt.
		F1: General Help
		F2: Previous Values
		F3: Optimized Defaults
		F4: Save & Exit
		ESC: Exit
Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.		

**BIOS Menu 6: CPU Configuration**

The CPU Configuration menu (**BIOS Menu 6**) lists the following CPU details:

- Processor Type: Lists the brand name of the CPU being used
- 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.
- CPU Speed: Lists the 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.
- Intel SMX Technology: Indicates if Intel SMX Technology is supported by the CPU.
- EIST Technology: Indicates if the Enhanced Intel SpeedStep® Technology (EIST) is supported by the CPU.
- 64-bit: Indicates if 64-bit 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.

#### ➔ Hyper-threading [Enabled]

Use the **Hyper-Threading** BIOS option to enable or disable the Intel Hyper-Threading Technology.

- ➔ **Disabled** Disables the Intel Hyper-Threading Technology.
- ➔ **Enabled** **DEFAULT** Enables the Intel Hyper-Threading Technology.

#### ➔ Active Processor Cores [All]

Use the **Active Processor Cores** option to configure the number of cores to enable in each processor package.

- ➔ **All** **DEFAULT** All cores are enabled in the processor package.
- ➔ **1** One of the cores is enabled in the processor package.

#### ➔ Intel Virtualization Technology [Disabled]

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** **DEFAULT** Disables Intel Virtualization Technology.
- ➔ **Enabled** Enables Intel Virtualization Technology.



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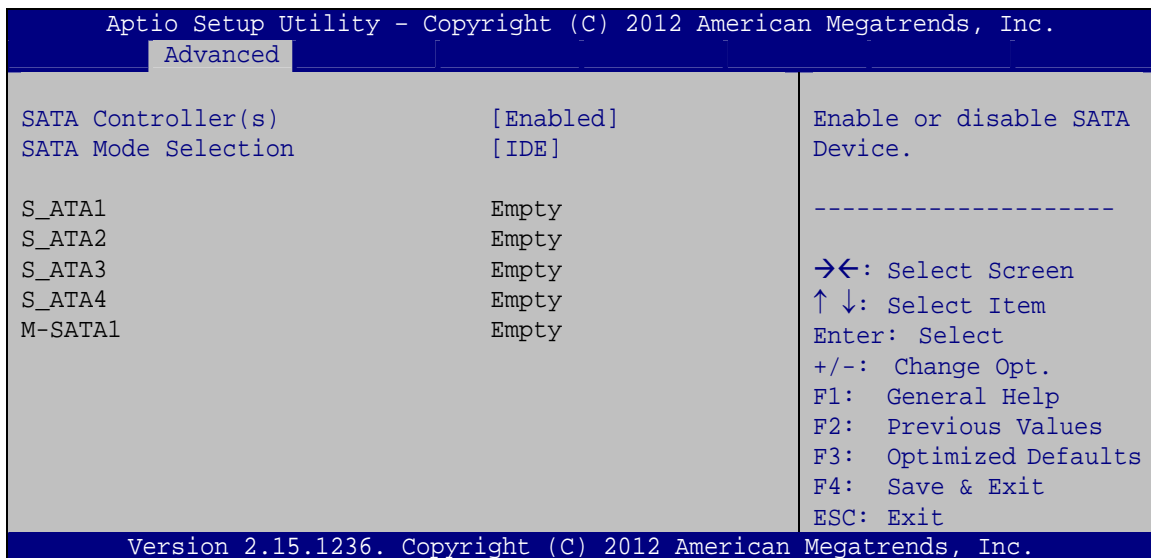
## ➔ EIST [Enabled]

Use the **EIST** BIOS option to enable or disable the Intel SpeedStep® Technology.

- ➔ **Disabled**                      Disables the Intel SpeedStep® Technology.
- ➔ **Enabled**      **DEFAULT**      Enables the Intel SpeedStep® Technology.

### 5.3.5 SATA Configuration

Use the **SATA Configuration** menu (**BIOS Menu 7**) to change and/or set the configuration of the SATA devices installed in the system.



#### BIOS Menu 7: SATA Configuration

## ➔ SATA Controller(s) [Enabled]

Use the **SATA Controller(s)** option to configure the SATA controller.

- ➔ **Enabled**      **DEFAULT**      Enable SATA controller.
- ➔ **Disabled**                      Disable SATA controller.

## ➔ SATA Mode Selection [IDE]

Use the **SATA Mode Selection** option to configure SATA devices.

- ➔ **IDE**                      **DEFAULT**      Configures SATA devices as normal IDE device.
- ➔ **AHCI**                                      Configures SATA devices as AHCI device.
- ➔ **RAID**                                      Configures SATA devices as RAID device.

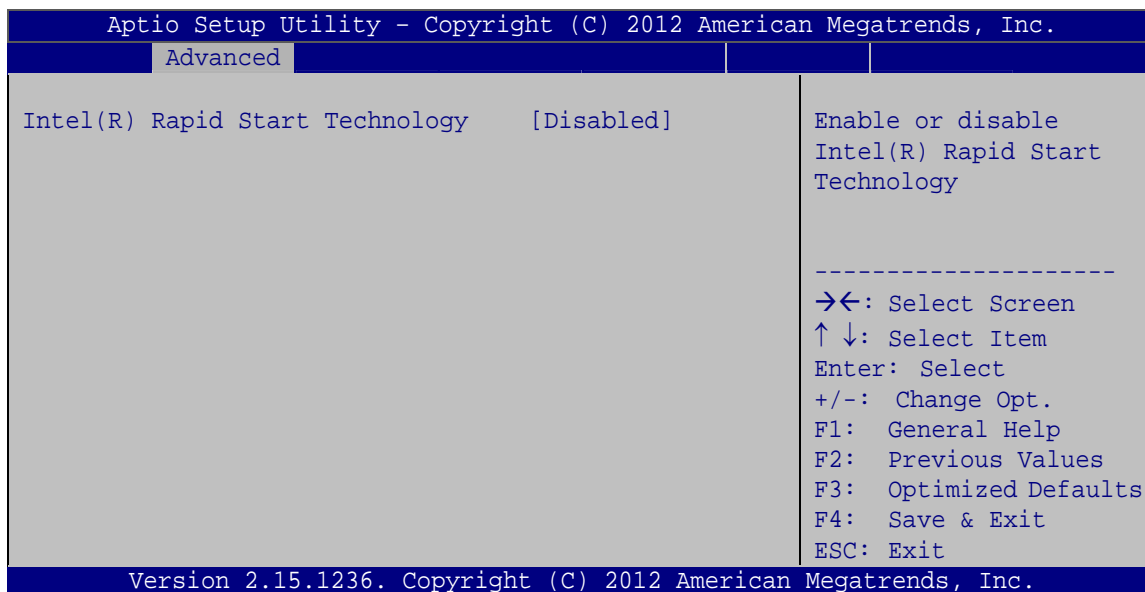


## NOTE:

Before accessing the RAID configuration utility, ensure to set the **Option ROM Messages** BIOS option in the **Boot** menu to **Force BIOS**. This is to allow the “Press <CTRL+I> to enter Configuration Utility.....” message to appear during POST. Press Ctrl+I when prompted to enter the RAID configuration utility.

## 5.3.6 Intel(R) Rapid Start Technology

Use the **Intel(R) Rapid Start Technology (BIOS Menu 8)** menu to configure Intel® Rapid Start Technology support.



**BIOS Menu 8: Intel(R) Rapid Start Technology**

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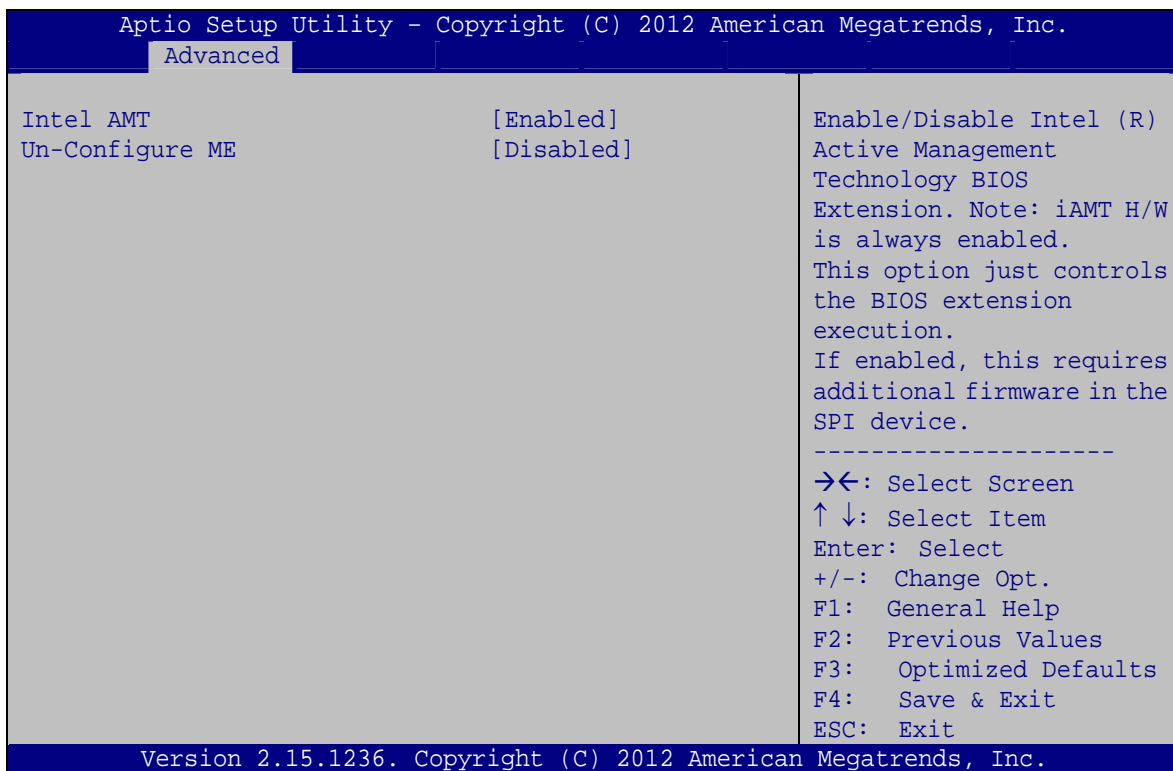
## ➔ Intel(R) Rapid Start Technology [Disabled]

Use **Intel(R) Rapid Start Technology** option to enable or disable the Intel® Rapid Start Technology function.

- ➔ **Disabled**      **DEFAULT**      Intel® Rapid Start Technology is disabled
- ➔ **Enabled**                      Intel® Rapid Start Technology is enabled

## 5.3.7 AMT Configuration

The **AMT Configuration** menu (**BIOS Menu 9**) allows the advanced power management options to be configured.



## BIOS Menu 9: AMT Configuration

## ➔ Intel AMT [Enabled]

Use **Intel AMT** option to enable or disable the Intel® AMT function.

- ➔ **Disabled**                      Intel® AMT is disabled

➔ **Enabled**      **DEFAULT**      Intel® AMT is enabled

➔ **Un-Configure ME [Disabled]**

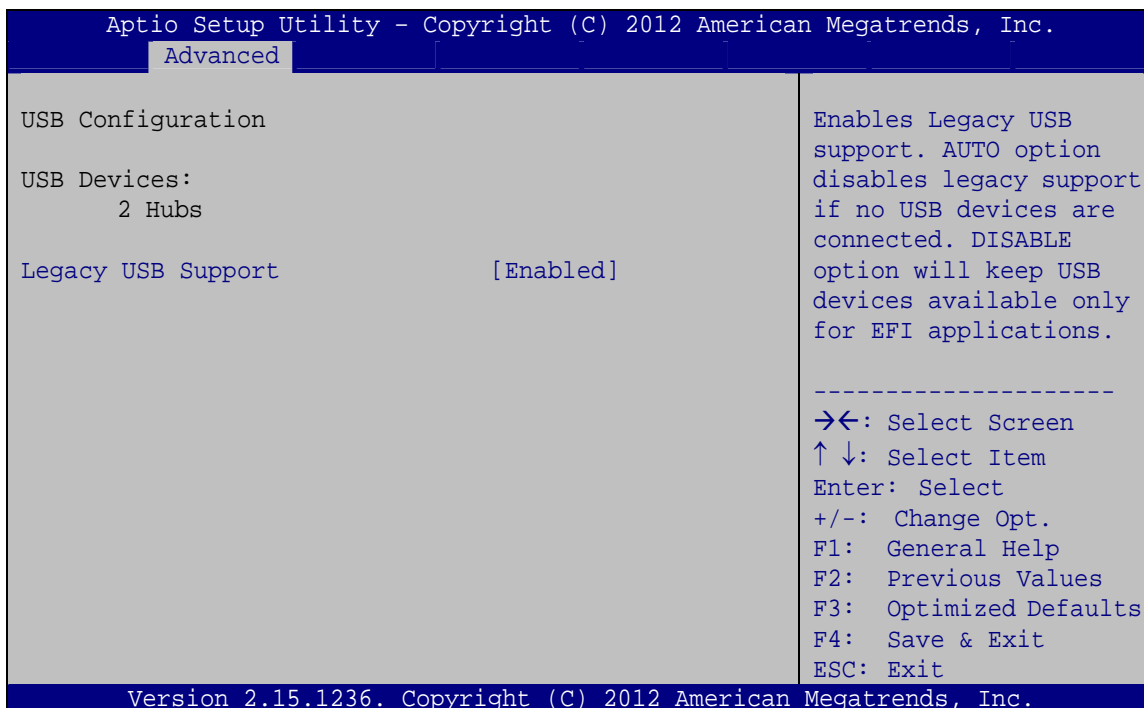
Use the **Un-Configure ME** option to perform ME unconfigure without password operation.

➔ **Disabled**      **DEFAULT**      Not perform ME unconfigure

➔ **Enabled**      To perform ME unconfigure

## 5.3.8 USB Configuration

Use the **USB Configuration** menu (**BIOS Menu 10**) to read USB configuration information and configure the USB settings.



### BIOS Menu 10: USB Configuration

➔ **USB Devices**

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

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## ➔ Legacy USB Support [Enabled]

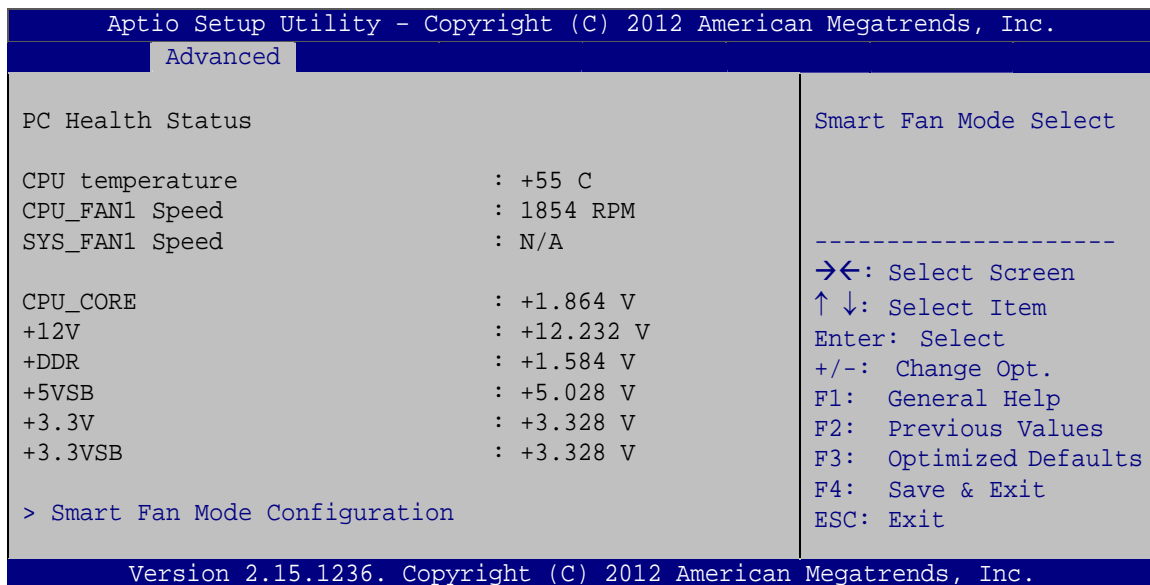
Use the **Legacy USB Support** BIOS option to enable USB mouse and USB keyboard support.

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

## 5.3.9 iWDD H/W Monitor

The **iWDD H/W Monitor** menu (**BIOS Menu 11**) displays the CPU temperature and CPU fan speed, and contains the fan configuration submenu.



**BIOS Menu 11: iWDD H/W Monitor**



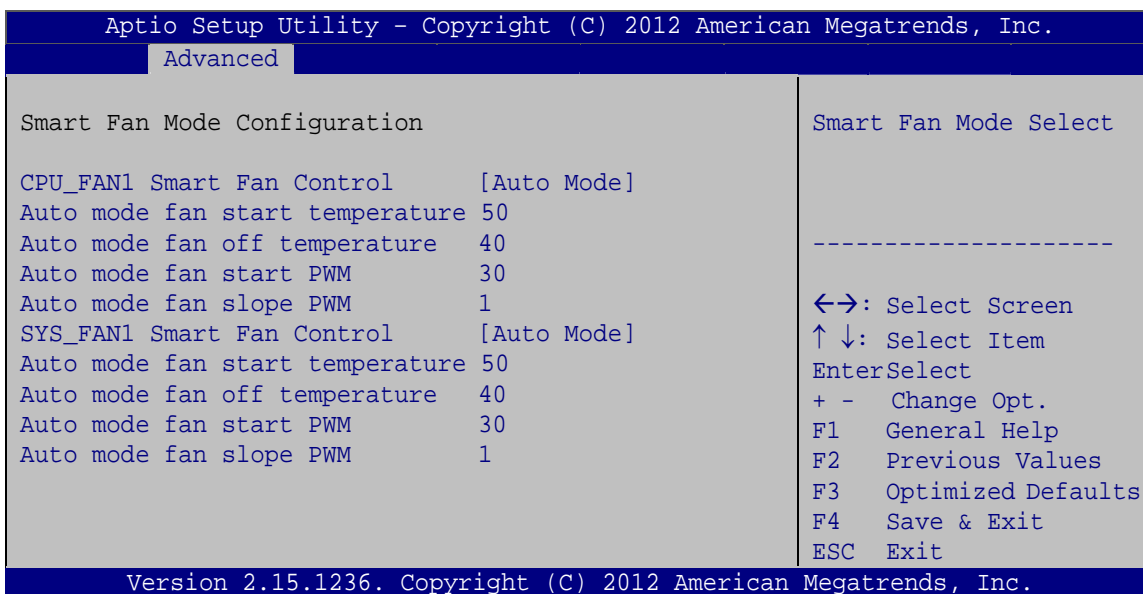
➔ **PC Health Status**

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

- CPU Temperature
- CPU\_FAN1 Speed
- SYS\_FAN1 Speed

### 5.3.9.1 Smart Fan Mode Configuration

Use the **Smart Fan Mode Configuration** submenu (**BIOS Menu 12**) to configure the smart fan temperature and speed settings.



#### BIOS Menu 12: Smart Fan Mode Configuration

➔ **CPU\_FAN1/SYS\_FAN1 Smart Fan Control [Auto Mode]**

Use the **Fan 1 Smart Fan Control** option to configure the CPU Smart Fan.

- ➔ **Manual Mode**                      The fan spins at the speed set in Manual by Duty Cycle settings
- ➔ **Auto Mode**                      **DEFAULT**      The fan adjusts its speed using Auto by Duty-Cycle settings

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## ➔ 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

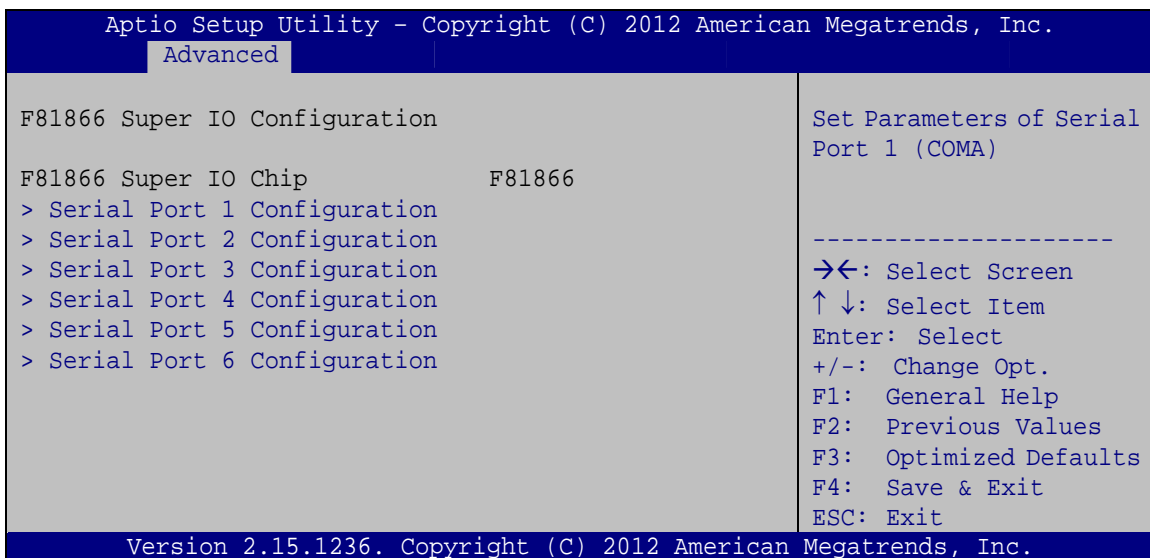
Use the + or – key to change the **Auto mode fan start PWM** value. Enter a decimal number between 1 and 100.

## ➔ 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.

## 5.3.10 F81866 Super IO Configuration

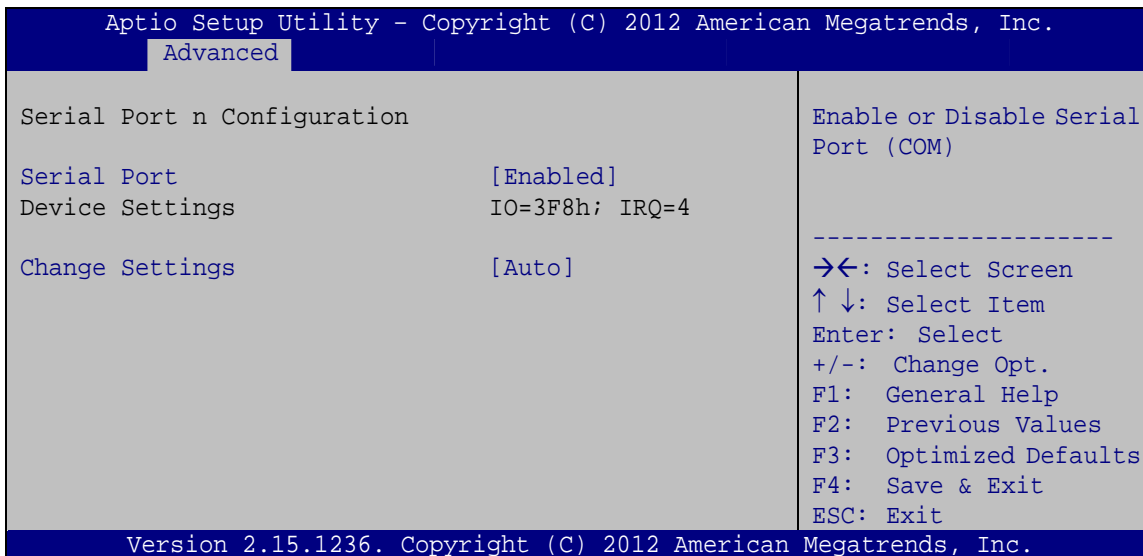
Use the **F81866 Super IO Configuration** menu (**BIOS Menu 13**) to set or change the configurations for the serial ports.



**BIOS Menu 13: F81866 Super IO Configuration**

### 5.3.10.1 Serial Port n Configuration

Use the **Serial Port n Configuration** menu (**BIOS Menu 14**) to configure the serial port n.



**BIOS Menu 14: Serial Port n Configuration Menu**

#### 5.3.10.1.1 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;**  
**IRQ=4**                      Serial Port I/O port address is 3F8h and the interrupt address is IRQ4

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- ➔ **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=2C0h;**  
**IRQ=3, 4**      Serial Port I/O port address is 2C0h and the interrupt address is IRQ3, 4
- ➔ **IO=2C8h;**  
**IRQ=3, 4**      Serial Port I/O port address is 2C8h and the interrupt address is IRQ3, 4

## 5.3.10.1.2 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=2C0h;**  
**IRQ=3, 4**      Serial Port I/O port address is 2C0h and the interrupt address is IRQ3, 4



- ➔

IO=2C8h;  
IRQ=3, 4

Serial Port I/O port address is 2C8h and the interrupt address is IRQ3, 4

5.3.10.1.3 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.
- ➔

IO=3E8h;  
IRQ=11

Serial Port I/O port address is 3E8h and the interrupt address is IRQ11
- ➔

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=2D8h;  
IRQ=10, 11

Serial Port I/O port address is 2D8h and the interrupt address is IRQ10, 11





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## 5.3.10.1.4 Serial Port 4 Configuration

## → Serial Port [Enabled]

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

- |   |                 |                |                         |
|---|-----------------|----------------|-------------------------|
| → | <b>Disabled</b> |                | Disable the serial port |
| → | <b>Enabled</b>  | <b>DEFAULT</b> | Enable the serial port  |

## → Change Settings [Auto]

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

- |   |                                |                |   |
|---|--------------------------------|----------------|---|
| → | <b>Auto</b>                    | <b>DEFAULT</b> | The serial port IO port address and interrupt address are automatically detected. |
| → | <b>IO=2E8h;<br/>IRQ=10</b>     |                | Serial Port I/O port address is 2E8h and the interrupt address is IRQ10           |
| → | <b>IO=3E8h;<br/>IRQ=10, 11</b> |                | Serial Port I/O port address is 3E8h and the interrupt address is IRQ10, 11       |
| → | <b>IO=2E8h;<br/>IRQ=10, 11</b> |                | Serial Port I/O port address is 2E8h and the interrupt address is IRQ10, 11       |
| → | <b>IO=2D0h;<br/>IRQ=10, 11</b> |                | Serial Port I/O port address is 2D0h and the interrupt address is IRQ10, 11       |
| → | <b>IO=2D8h;<br/>IRQ=10, 11</b> |                | Serial Port I/O port address is 2D8h and the interrupt address is IRQ10, 11       |

## 5.3.10.1.5 Serial Port 5 Configuration

## → Serial Port [Enabled]

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

- |   |                 |  |                         |
|---|-----------------|--|-------------------------|
| → | <b>Disabled</b> |  | 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.

- |   |                                      |                |   |
|---|--------------------------------------|----------------|---|
| ➔ | <b>Auto</b>                          | <b>DEFAULT</b> | The serial port IO port address and interrupt address are automatically detected. |
| ➔ | <b>IO=2D0h;</b><br><b>IRQ=11</b>     |                | Serial Port I/O port address is 2D0h and the interrupt address is IRQ11           |
| ➔ | <b>IO=2C0h;</b><br><b>IRQ=10, 11</b> |                | Serial Port I/O port address is 2C0h and the interrupt address is IRQ10, 11       |
| ➔ | <b>IO=2C8h;</b><br><b>IRQ=10, 11</b> |                | Serial Port I/O port address is 2C8h and the interrupt address is IRQ10, 11       |
| ➔ | <b>IO=2D0h;</b><br><b>IRQ=10, 11</b> |                | Serial Port I/O port address is 2D0h and the interrupt address is IRQ10, 11       |
| ➔ | <b>IO=2D8h;</b><br><b>IRQ=10, 11</b> |                | Serial Port I/O port address is 2D8h and the interrupt address is IRQ10, 11       |
| ➔ | <b>IO=2E0h;</b><br><b>IRQ=10, 11</b> |                | Serial Port I/O port address is 2E0h and the interrupt address is IRQ10, 11       |

## 5.3.10.1.6 Serial Port 6 Configuration

### ➔ Serial Port [Enabled]

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

- |   |                 |                |                         |
|---|-----------------|----------------|-------------------------|
| ➔ | <b>Disabled</b> |                | Disable the serial port |
| ➔ | <b>Enabled</b>  | <b>DEFAULT</b> | Enable the serial port  |

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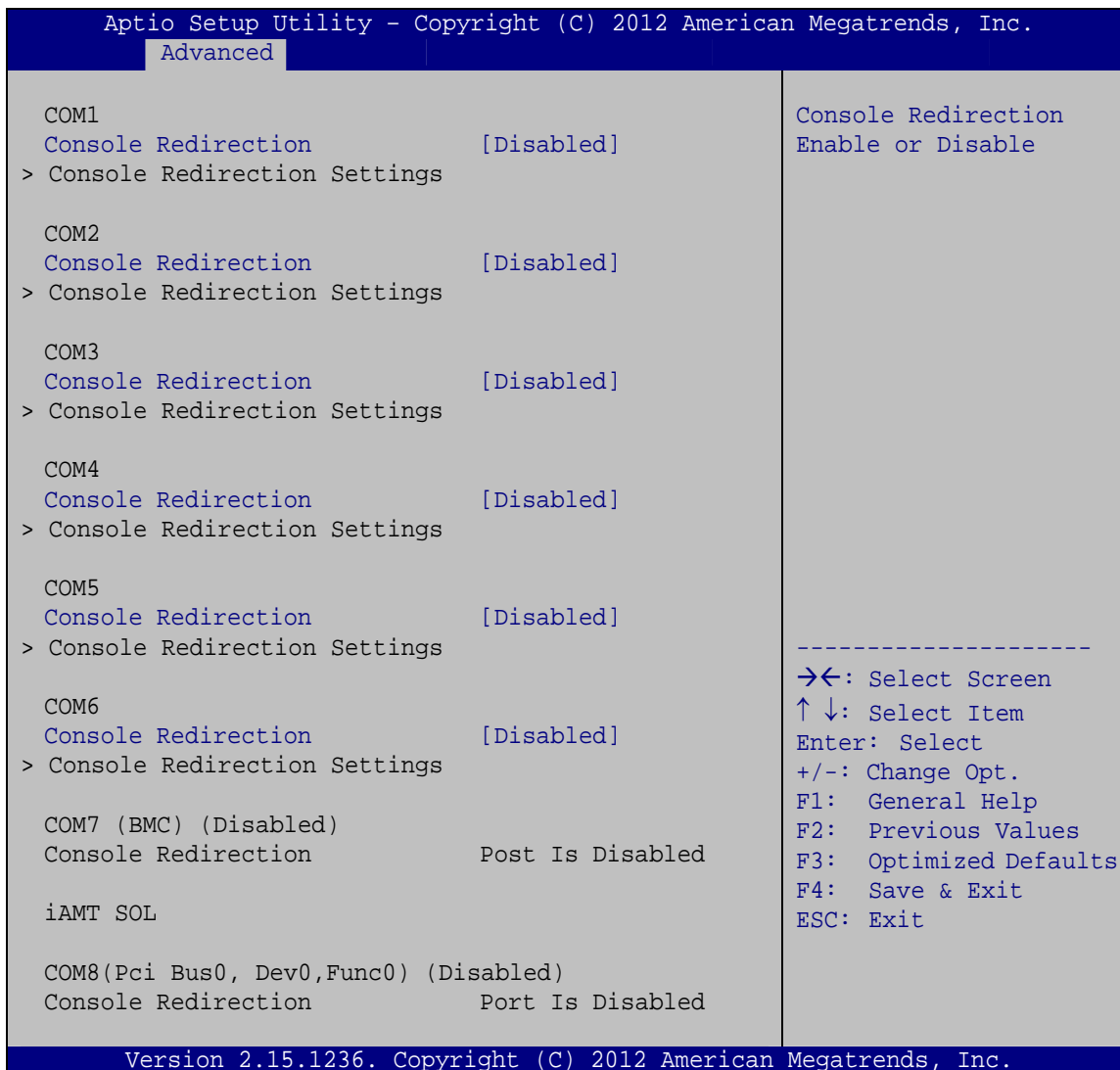
→ **Change Settings [Auto]**

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

→	<b>Auto</b>	<b>DEFAULT</b>	The serial port IO port address and interrupt address are automatically detected.
→	<b>IO=2D8h; IRQ=10</b>		Serial Port I/O port address is 2D8h and the interrupt address is IRQ10
→	<b>IO=2C0h; IRQ=10, 11</b>		Serial Port I/O port address is 2C0h and the interrupt address is IRQ10, 11
→	<b>IO=2C8h; IRQ=10, 11</b>		Serial Port I/O port address is 2C8h and the interrupt address is IRQ10, 11
→	<b>IO=2D0h; IRQ=10, 11</b>		Serial Port I/O port address is 2D0h and the interrupt address is IRQ10, 11
→	<b>IO=2D8h; IRQ=10, 11</b>		Serial Port I/O port address is 2D8h and the interrupt address is IRQ10, 11
→	<b>IO=2E0h; IRQ=10, 11</b>		Serial Port I/O port address is 2E0h and the interrupt address is IRQ10, 11

### 5.3.11 Serial Port Console Redirection

The **Serial Port Console Redirection** menu (**BIOS Menu 15**) 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 15: 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

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**NOTE:**

The following five options appear 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.  |
| → | 38400  |         | Sets the serial port transmission speed at 38400.  |
| → | 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.

- |                |                |   |
|----------------|----------------|---|
| <b>→ None</b>  | <b>DEFAULT</b> | No parity bit is sent with the data bits.                                 |
| <b>→ Even</b>  |                | The parity bit is 0 if the number of ones in the data bits is even.       |
| <b>→ Odd</b>   |                | The parity bit is 0 if the number of ones in the data bits is odd.        |
| <b>→ Mark</b>  |                | The parity bit is always 1. This option does not provide error detection. |
| <b>→ Space</b> |                | The parity bit is always 0. This option does not provide error detection. |

**→ Stop Bits [1]**

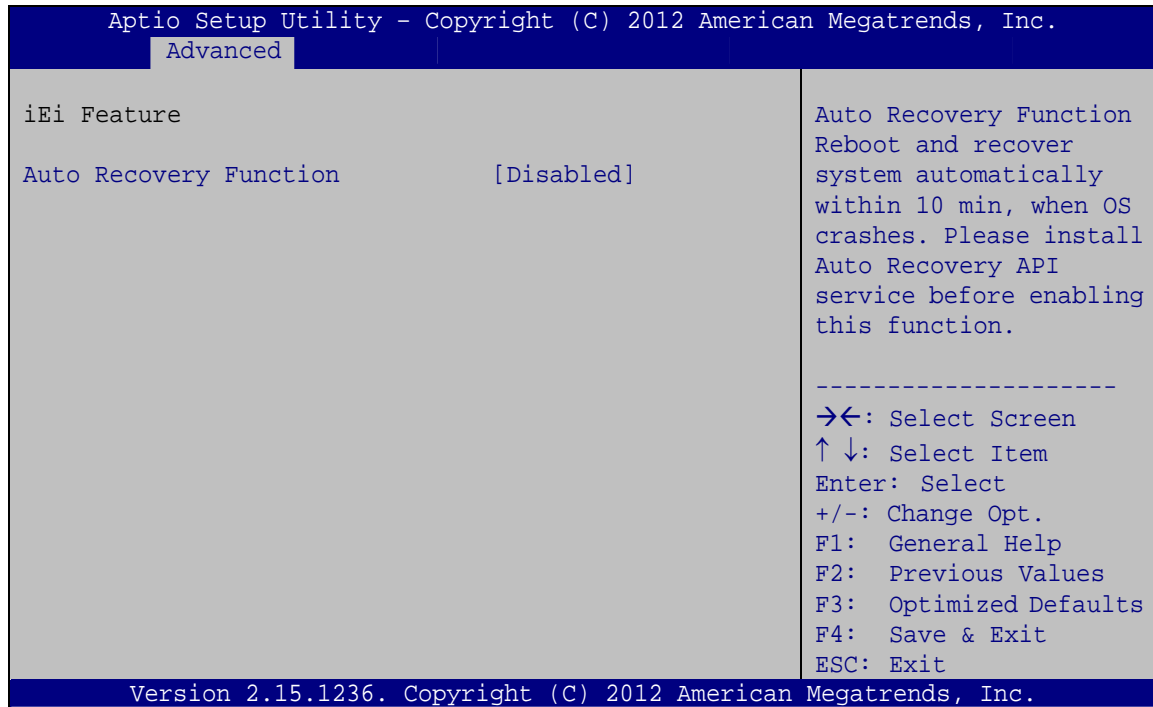
Use the **Stop Bits** option to specify the number of stop bits used to indicate the end of a serial data packet. Communication with slow devices may require more than 1 stop bit.

- |            |                |                                    |
|------------|----------------|------------------------------------|
| <b>→ 1</b> | <b>DEFAULT</b> | Sets the number of stop bits at 1. |
| <b>→ 2</b> |                | Sets the number of stop bits at 2. |

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## 5.3.12 iEi Feature

Use the **iEi Feature** menu (**BIOS Menu 16**) to configure One Key Recovery function.



## BIOS Menu 16: iEi Feature

## ➔ Auto Recovery Function [Disabled]

Use the **Auto Recovery Function** BIOS option to enable or disable the auto recovery function of the IEI One Key Recovery.

- ➔ **Disabled**      **DEFAULT**      Auto recovery function disabled
- ➔ **Enabled**                      Auto recovery function enabled

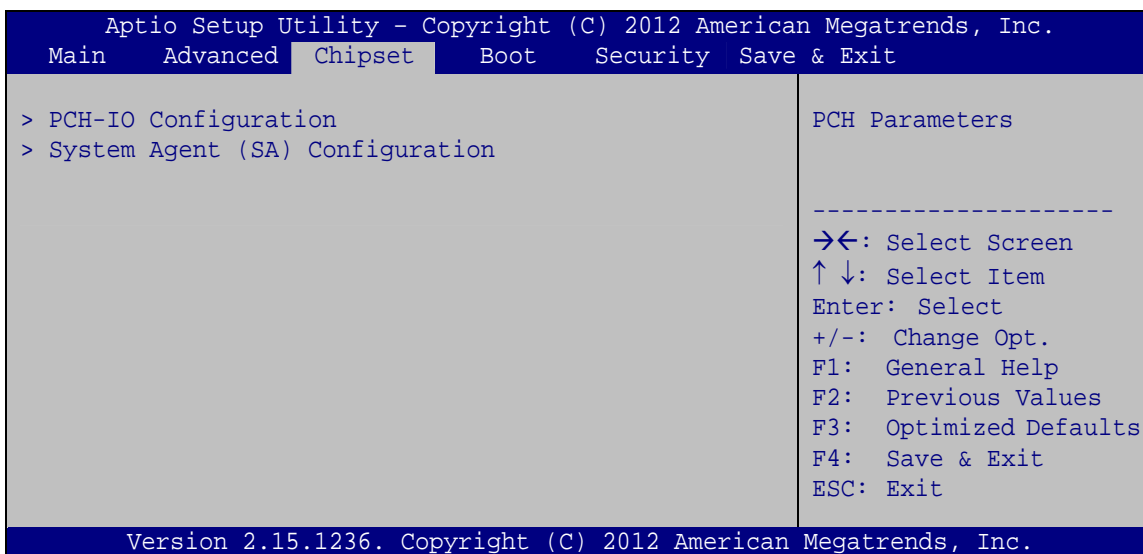
## 5.4 Chipset

Use the **Chipset** menu (**BIOS Menu 17**) to access the PCH IO and System Agent (SA) configuration menus.



### WARNING!

Setting the wrong values for the Chipset BIOS selections in the Chipset BIOS menu may cause the system to malfunction.

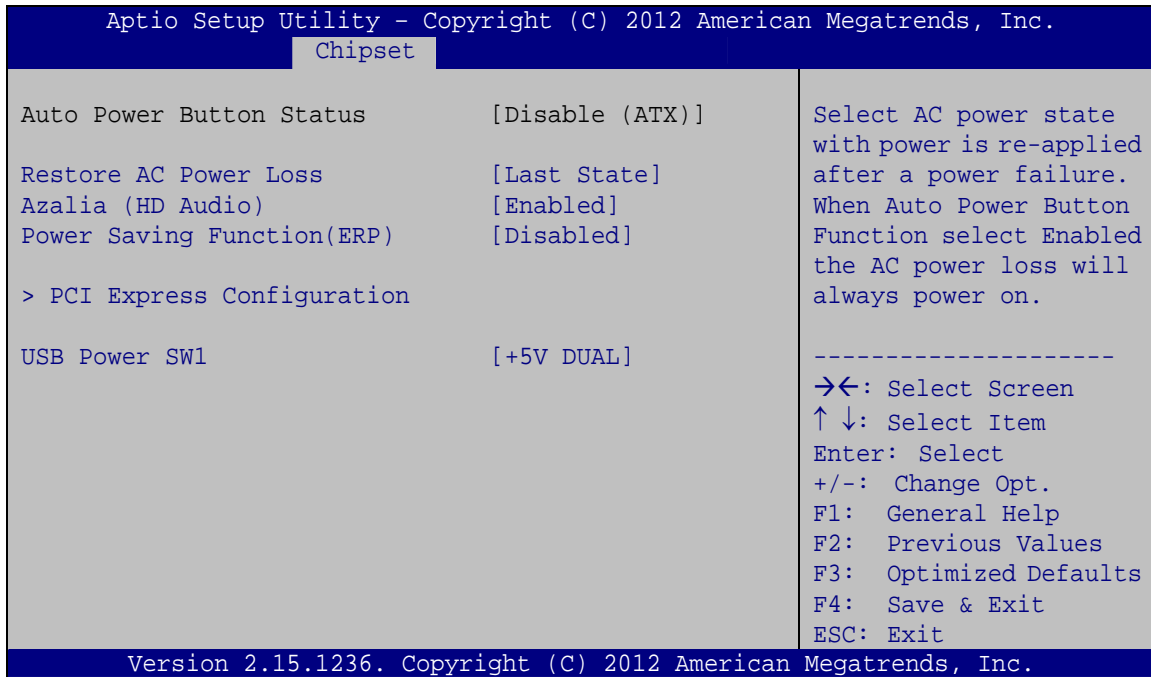


**BIOS Menu 17: Chipset**

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### 5.4.1 PCH-IO Configuration

Use the **PCH-IO Configuration** menu (**BIOS Menu 18**) to configure the PCH parameters.



#### BIOS Menu 18: PCH-IO 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.

- |   |                   |                |  |
|---|-------------------|----------------|--|
| → | <b>Power Off</b>  |                | The system remains turned off  |
| → | <b>Power On</b>   |                | The system turns on  |
| → | <b>Last State</b> | <b>DEFAULT</b> | The system returns to its previous state. If it was on, it turns itself on. If it was off, it remains off. |

**➔ Azalia (HD Audio) [Enabled]**

Use the **Azalia (HD Audio)** option to enable or disable the High Definition Audio controller.

- ➔ **Disabled**                      The onboard High Definition Audio controller is disabled
- ➔ **Enabled    DEFAULT**        The onboard High Definition Audio controller automatically detected and enabled

**➔ Power Saving Function [Disabled]**

Use the **Power Saving Function** option to enable or disable power saving function.

- ➔ **Disabled    DEFAULT**        Power saving function is disabled
- ➔ **Enabled**                        Enable to reduce power consumption in system off state.

**➔ USB Power SW1 [+5V DUAL]**

Use the **USB Power SW1** option to configure the power voltage for the following USB ports:

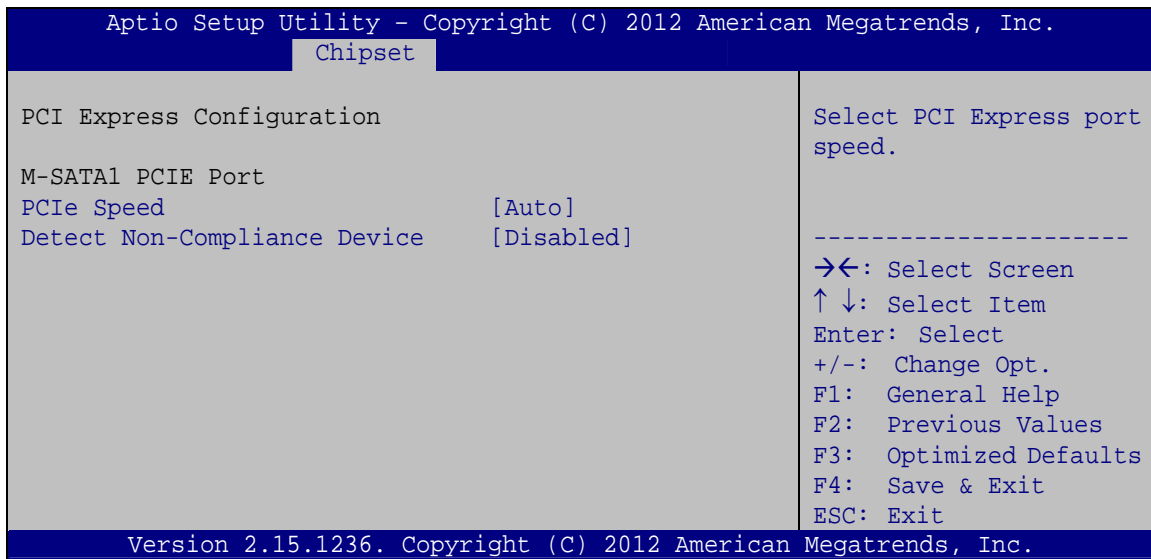
- LAN1\_USB1 (external USB 3.0 ports)
  - LAN2\_USB2 (external USB 2.0 ports)
  - CN1 (internal USB 2.0 and USB 3.0 ports)
- 
- ➔ **+5V**                              Use +5V power.
  - ➔ **+5V DUAL    DEFAULT**        Use +5V DUAL power.



## KINO-DQM871-i1 Mini-ITX SBC

## 5.4.1.1 PCI Express Configuration

Use the **PCI Express Configuration** menu (**BIOS Menu 19**) to select the support type of the PCIe Mini slot (M-SATA1).

**BIOS Menu 19: PCI Express Configuration****➔ PCIe Speed**

Use PCIe Speed option to select the speed type of the PCIe Mini slot (M-SATA1). The following options are available:

- Auto                      **Default**
- Gen1
- Gen2

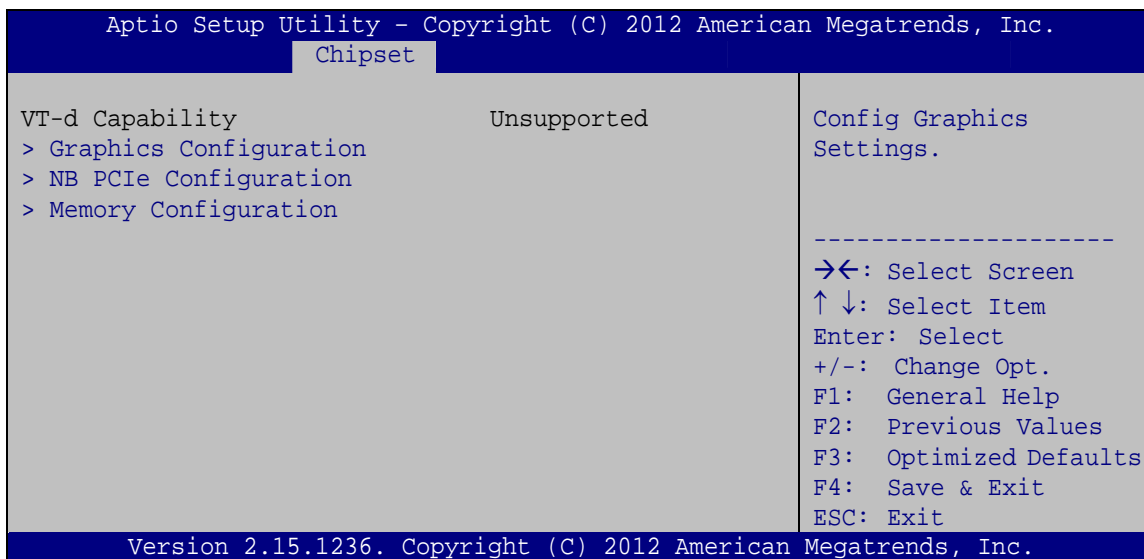
**➔ Detect Non-Compliance Device [Disabled]**

Use the **Detect Non-Compliance Device** option to enable or disable the “detect no-compliance PCIe device” function.

- ➔ **Disabled**    **DEFAULT**    Detect no-compliance PCIe device function is disabled
- ➔ **Enabled**                      Detect no-compliance PCIe device function is enabled. If will take more time at POST if it is enabled.

## 5.4.2 System Agent (SA) Configuration

Use the **System Agent (SA) Configuration** menu (**BIOS Menu 20**) to configure the System Agent (SA) parameters.

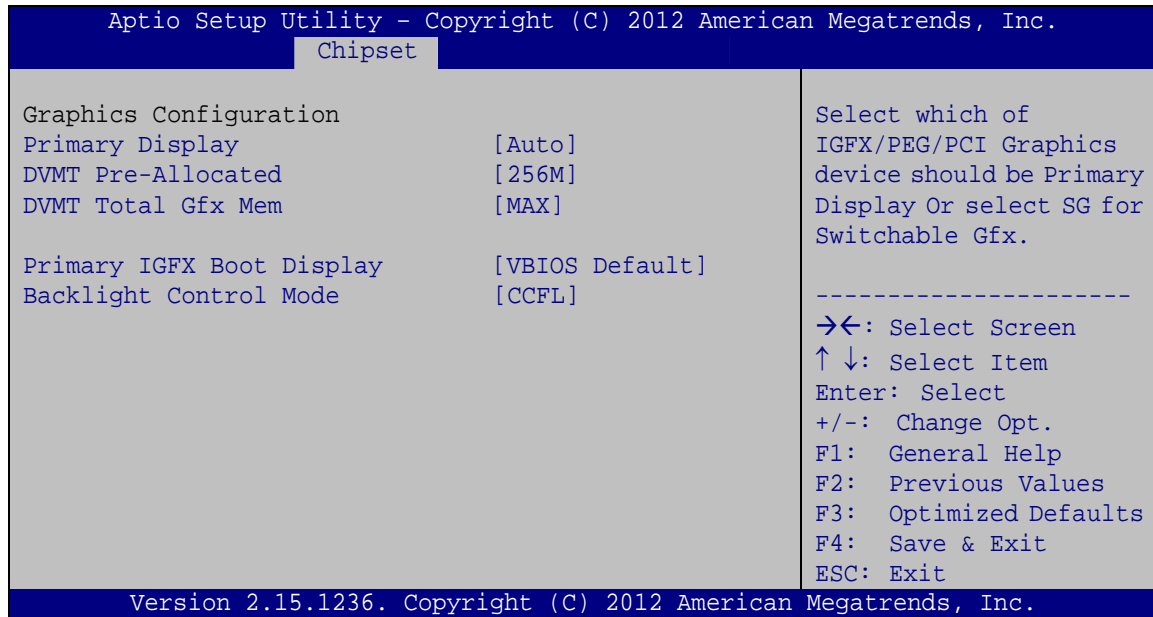


### BIOS Menu 20: System Agent (SA) Configuration

#### 5.4.2.1 Graphics Configuration

Use the **Graphics Configuration** (**BIOS Menu 21**) menu to configure the video device connected to the system.

## KINO-DQM871-i1 Mini-ITX SBC



### BIOS Menu 21: Graphics Configuration

#### ➔ Primary Display [Auto]

Use the **Primary Display** option to select the primary graphics controller the system uses. The following options are available:

- Auto **Default**
- IGFX
- PEG
- PCIE

#### ➔ DVMT Pre-Allocated [256M]

Use the **DVMT Pre-Allocated** option to set the amount of system memory allocated to the integrated graphics processor when the system boots. The system memory allocated can then only be used as graphics memory, and is no longer available to applications or the operating system. Configuration options are listed below:

- 32M
- 64M
- 128M
- 256M **Default**
- 512M

**→ DVMT Total Gfx Mem [MAX]**

Use the **DVMT Total Gfx Mem** option to select DVMT5.0 total graphic memory size used by the internal graphic device. The following options are available:

- 128M
- 256M
- 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.

- VBIOS Default              **DEFAULT**
- CRT
- LVDS
- Display port 1
- HDMI 1
- HDMI 2

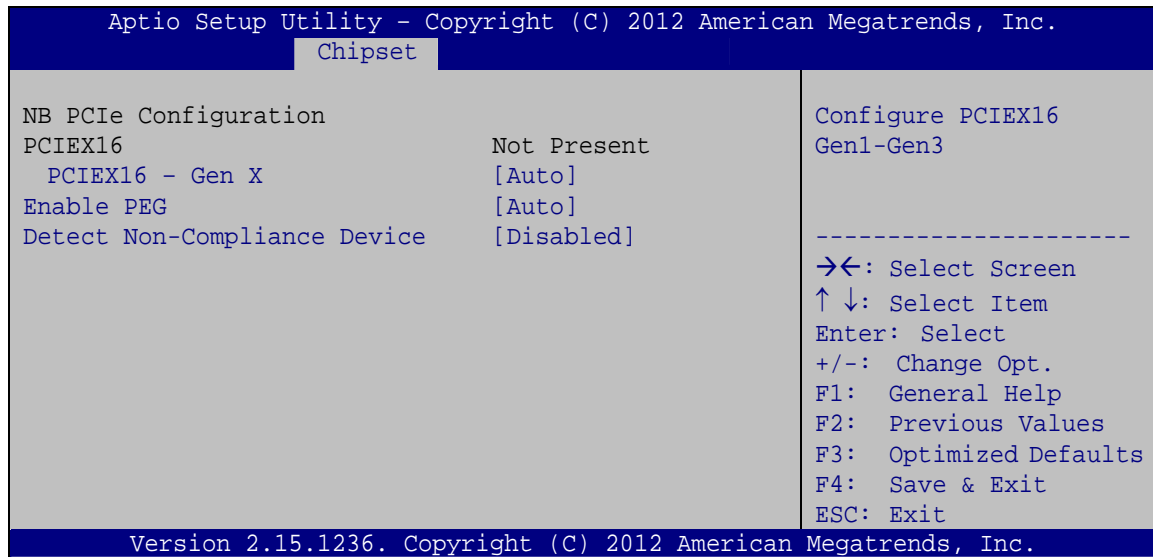
**→ Backlight Control Mode [CCFL]**

Use the **Backlight Control Mode** option to select the backlight control mode.

- LED**                              The LVDS backlight is brighter at high voltage level.
- CCFL**                      **DEFAULT**      The LVDS backlight is brighter at low voltage level.

## KINO-DQM871-i1 Mini-ITX SBC

## 5.4.2.2 NB PCIe Configuration



## BIOS Menu 22: NB PCIe Configuration

## ➔ PCIEX16 – Gen X [Auto]

Use the **PCIEX16 – Gen X** option to select the support type of the PCI Express x16 slot.

The following options are available:

- Auto                      **Default**
- Gen1
- Gen2
- Gen3

## ➔ Enable PEG [Auto]

Use the **Enable PEG** option to enable or disable the PCI Express controller. The following options are available:

- Disabled
- Enabled
- Auto                      **Default**

## ➔ Detect Non-Compliance Device [Disabled]

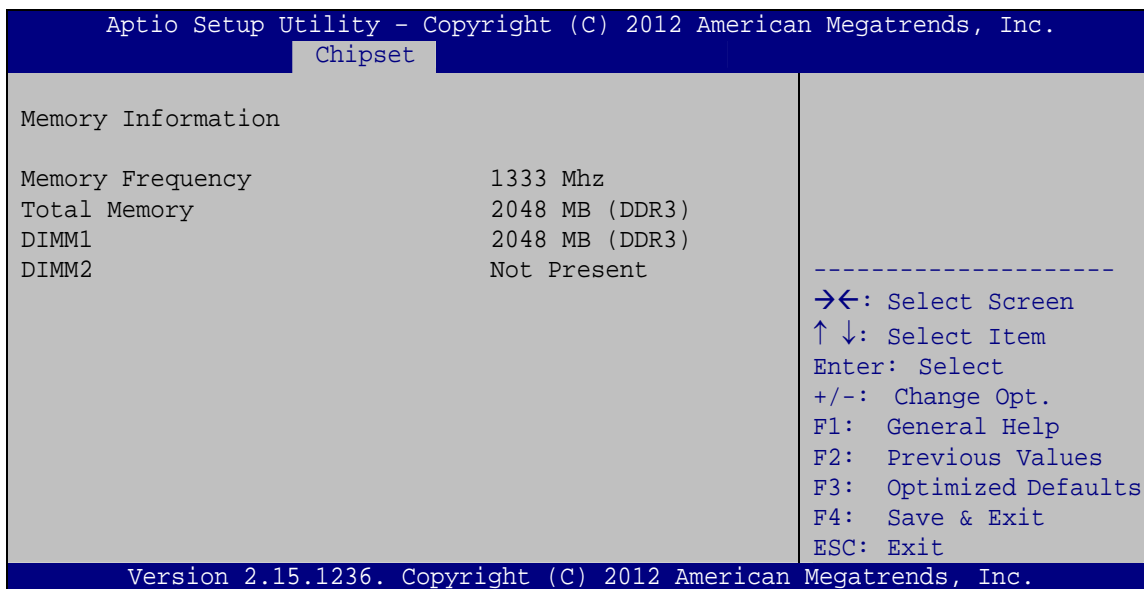
Use the **Detect Non-Compliance Device** option to enable or disable detecting a non-compliance PCI Express device in the PEG. The following options are available:



- Disabled      **Default**
- Enabled

### 5.4.2.3 Memory Configuration

Use the **Memory Configuration** submenu (**BIOS Menu 23**) to view memory information.

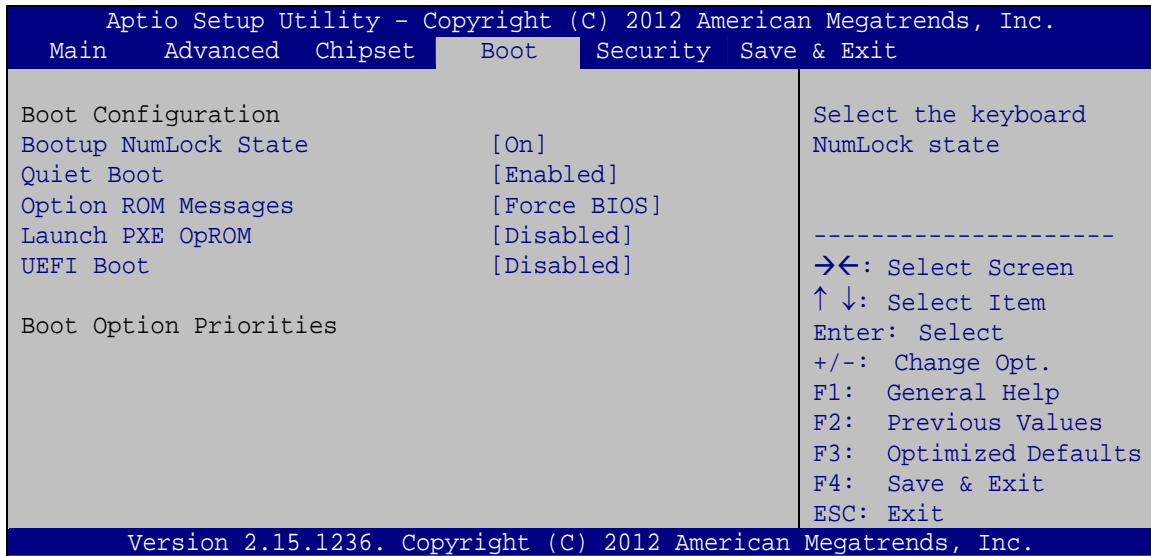


**BIOS Menu 23: Memory Configuration**

## KINO-DQM871-i1 Mini-ITX SBC

## 5.5 Boot

Use the **Boot menu (BIOS Menu 24)** to configure system boot options.

**BIOS Menu 24: 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.

**→ Quiet Boot [Enabled]**

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

- |   |                 |                |   |
|---|-----------------|----------------|---|
| → | <b>Disabled</b> |                | Normal POST messages displayed              |
| → | <b>Enabled</b>  | <b>DEFAULT</b> | OEM Logo displayed instead of POST messages |

**→ Option ROM Messages [Force BIOS]**

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

- |   |                     |                |                                  |
|---|---------------------|----------------|----------------------------------|
| → | <b>Force BIOS</b>   | <b>DEFAULT</b> | Sets display mode to force BIOS. |
| → | <b>Keep Current</b> |                | Sets display mode to current.    |

**→ Launch PXE OpROM [Disabled]**

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

- |   |                 |                |                            |
|---|-----------------|----------------|----------------------------|
| → | <b>Disabled</b> | <b>DEFAULT</b> | Ignore all PXE Option ROMs |
| → | <b>Enabled</b>  |                | Load PXE Option ROMs.      |

**→ UEFI Boot [Disabled]**

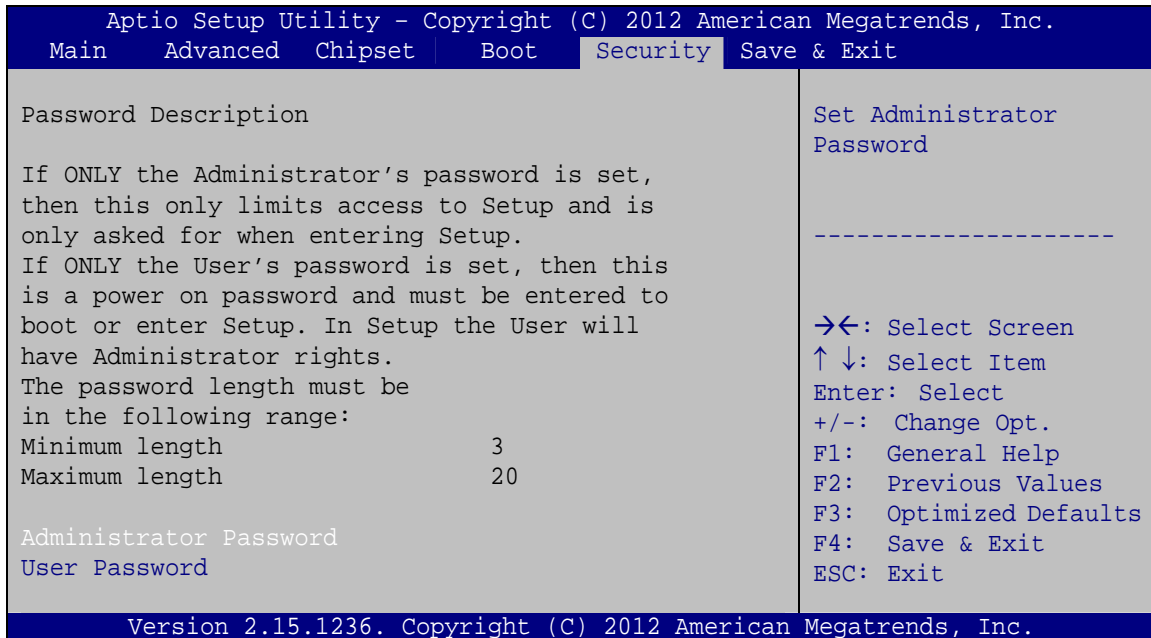
Use the **UEFI Boot** BIOS option to allow the system to boot from the UEFI devices.

- |   |                 |                |   |
|---|-----------------|----------------|---|
| → | <b>Disabled</b> | <b>DEFAULT</b> | Disables to boot from the UEFI devices. |
| → | <b>Enabled</b>  |                | Enables to boot from the UEFI devices.  |

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## 5.6 Security

Use the **Security** menu (**BIOS Menu 25**) to set system and user passwords.



### BIOS Menu 25: Security

#### → Administrator Password

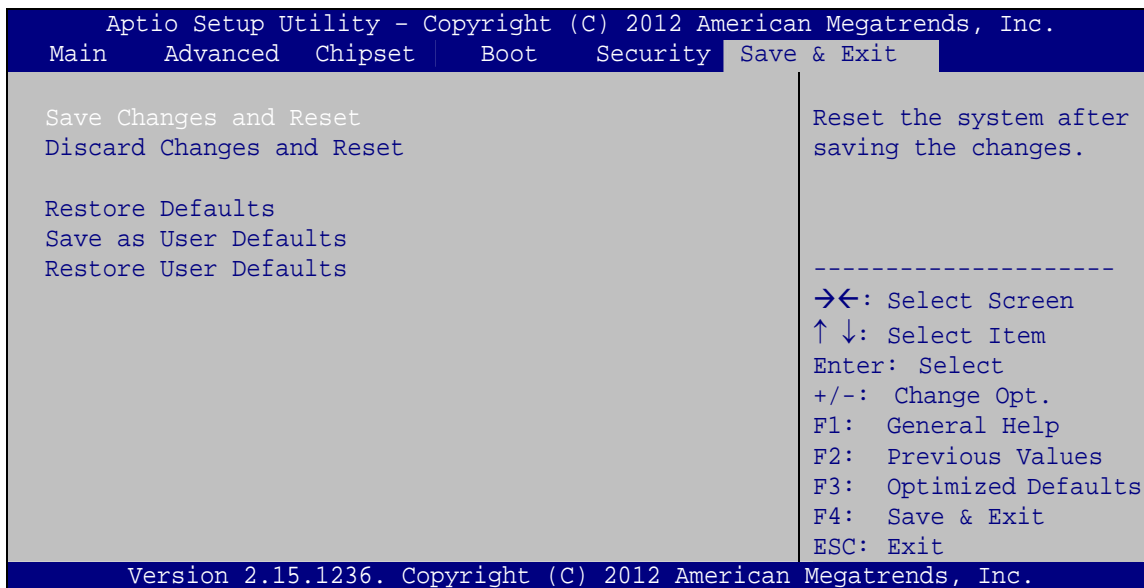
Use the **Administrator Password** to set or change an administrator password.

#### → User Password

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

## 5.7 Save & Exit

Use the **Save & Exit** menu (**BIOS Menu 26**) to load default BIOS values, optimal failsafe values and to save configuration changes.



#### BIOS Menu 26: 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 Software Drivers

---

**NOTE:**

The content of the CD may vary throughout the life cycle of the product and is subject to change without prior notice. Visit the IEI website or contact technical support for the latest updates.

---

The following drivers can be installed on the system:

- Chipset
- Graphics
- LAN
- USB 3.0
- Audio
- Intel® AMT

Installation instructions are given below.

## 6.2 Starting the Driver Program

To access the driver installation programs, please do the following.

**Step 1:** Insert the CD that came with the system into a CD drive connected to the system.

---

**NOTE:**

If the installation program doesn't start automatically:  
Click "Start->Computer->CD Drive->autorun.exe"

---

**Step 2:** The driver main menu appears (**Figure 6-1**).

## KINO-DQM871-i1 Mini-ITX SBC



Figure 6-1: Start Up Screen

**Step 3:** Click **KINO-DQM871**.

**Step 4:** The list of drivers in **Figure 6-2** appears.



Figure 6-2: Drivers

## 6.3 Chipset Driver Installation

To install the chipset driver, please do the following.

**Step 1:** Access the driver list. (See **Section 6.2**)

**Step 2:** Click “1-Chipset”.

**Step 3:** Locate the setup file and double click on it.

**Step 4:** The **Welcome Screen** in **Figure 6-3** appears. Click **Next** to continue.



**Figure 6-3: Chipset Driver Welcome Screen**

**Step 5:** The license agreement in **Figure 6-4** appears.

**Step 6:** Read the **License Agreement**.

**Step 7:** Click **Yes** to continue.



## KINO-DQM871-i1 Mini-ITX SBC



Figure 6-4: Chipset Driver License Agreement

**Step 8:** The **Read Me** file in Figure 6-5 appears.

**Step 9:** Click **Next** to continue.

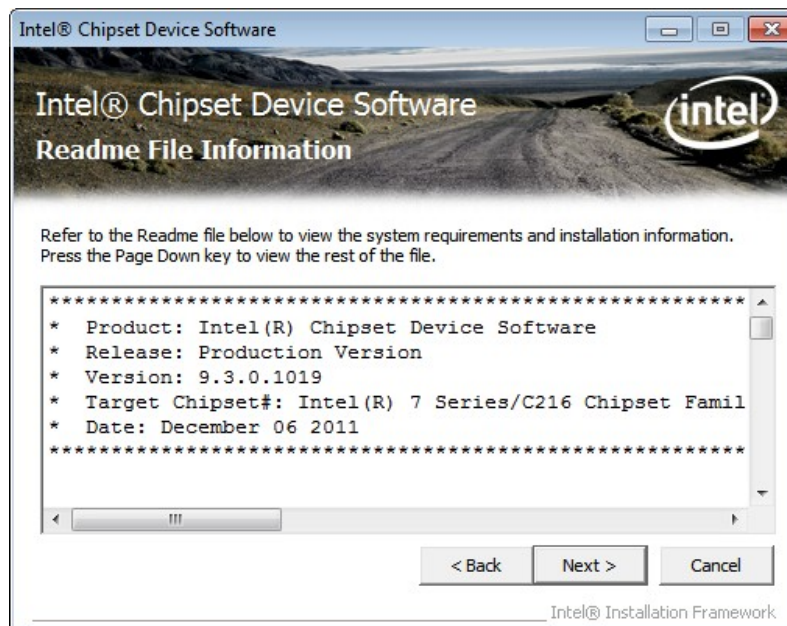
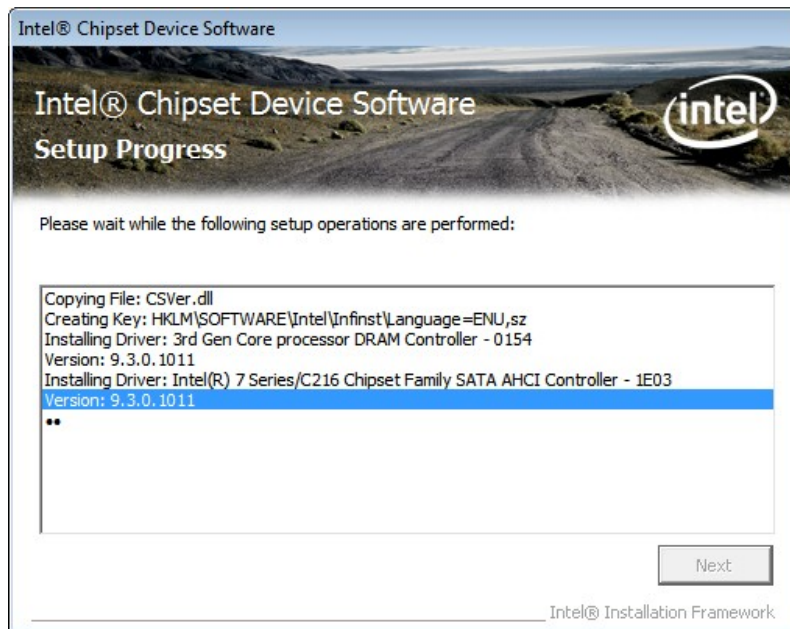


Figure 6-5: Chipset Driver Read Me File



**Step 10:** Setup Operations are performed as shown in Figure 6-6.



**Figure 6-6: Chipset Driver Setup Operations**

**Step 11:** Once the Setup Operations are complete, click **Next** to continue.

**Step 12:** The **Finish** screen in Figure 6-7 appears.

**Step 13:** Select “Yes, I want to restart the computer now” and click the **Finish** icon.

See Figure 6-7.

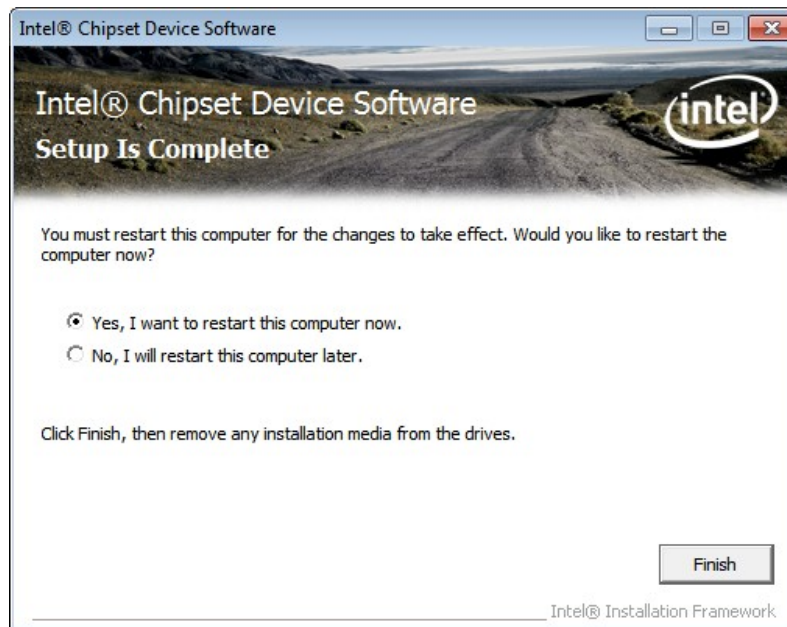


Figure 6-7: Chipset Driver Installation Finish Screen

## 6.4 Graphics Driver Installation

To install the graphics driver, please do the following.

- Step 1:** Access the driver list. (See **Section 6.2**)
- Step 2:** Click "**2-Graphics**" and select the folder which corresponds to the operating system.
- Step 3:** Double click the setup file.
- Step 4:** The **Welcome Screen** in **Figure 6-8** appears. Click **Next** to continue.

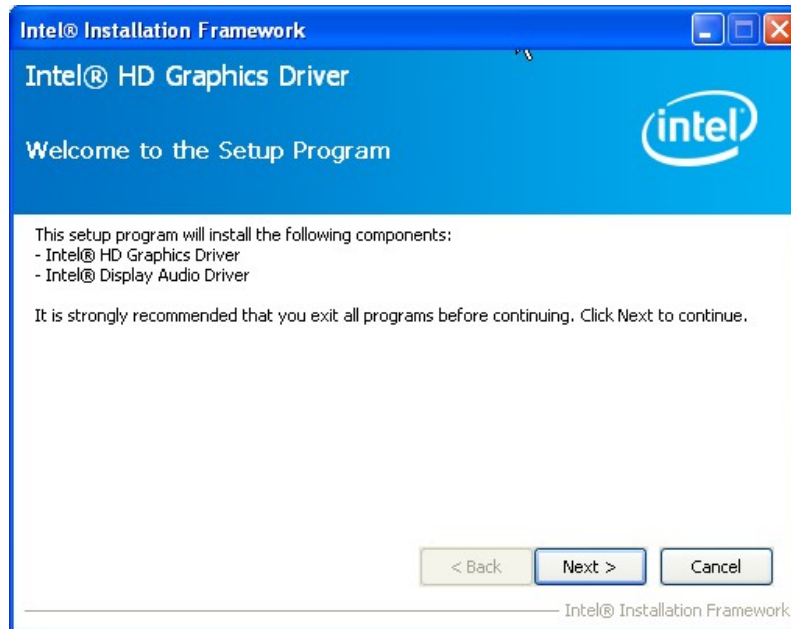


Figure 6-8: Graphics Driver Welcome Screen

**Step 5:** The license agreement in **Figure 6-9** appears. Read the **License Agreement**.

**Step 6:** Click **Yes** to continue.

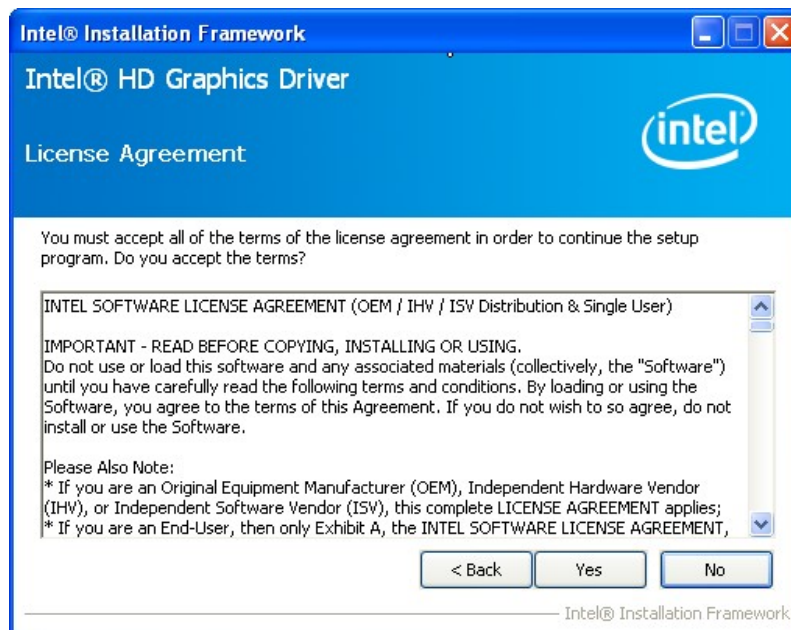
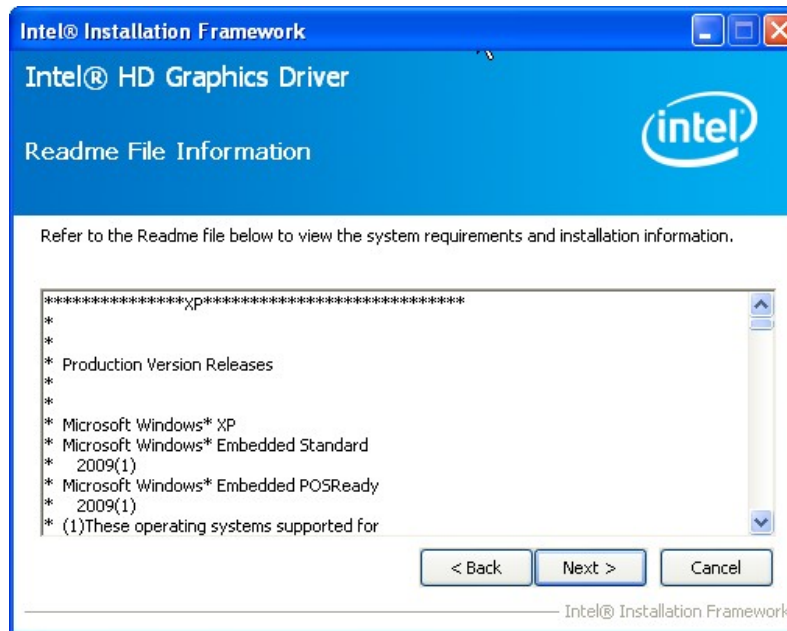


Figure 6-9: Graphics Driver License Agreement

**KINO-DQM871-i1 Mini-ITX SBC**

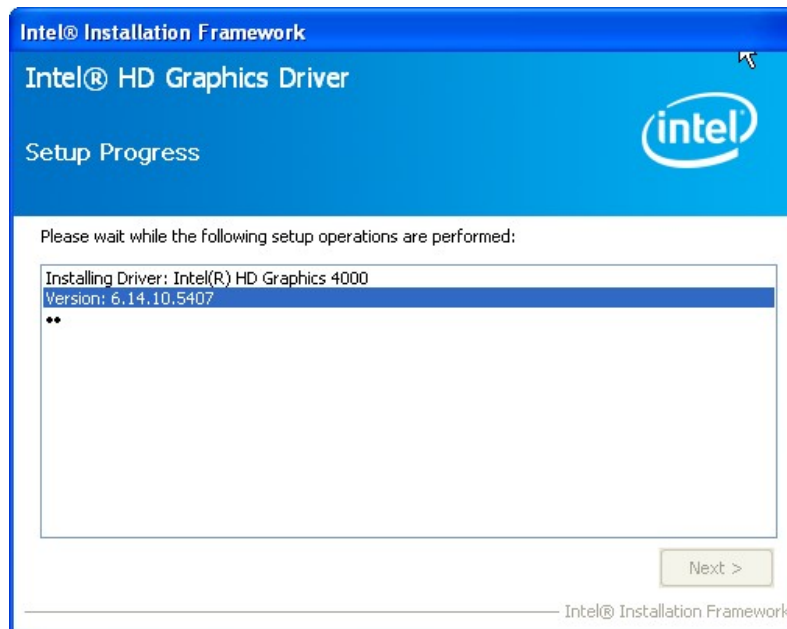
**Step 7:** The Read Me file in **Figure 6-10** appears.

**Step 8:** Click **Next** to continue.



**Figure 6-10: Graphics Driver Read Me File**

**Step 9:** **Setup Operations** are performed as shown in **Figure 6-11**.



**Figure 6-11: Graphics Driver Setup Operations**

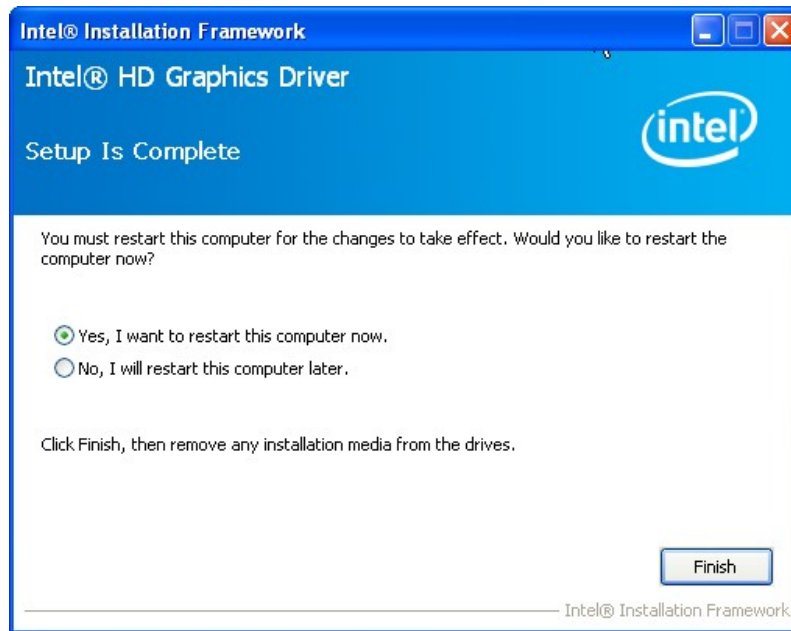


**Step 10:** Once the **Setup Operations** are complete, click the **Next** icon to continue.

**Step 11:** The **Finish** screen appears.

**Step 12:** Select “**Yes, I want to restart the computer now**” and click the **Finish** icon.

See **Figure 6-12**.



**Figure 6-12: Graphics Driver Installation Finish Screen**

## 6.5 LAN Driver Installation

To install the LAN driver, please do the following.

**Step 1:** Right-click the Computer button from the start menu and select **Properties**

(**Figure 6-13**).



## KINO-DQM871-i1 Mini-ITX SBC

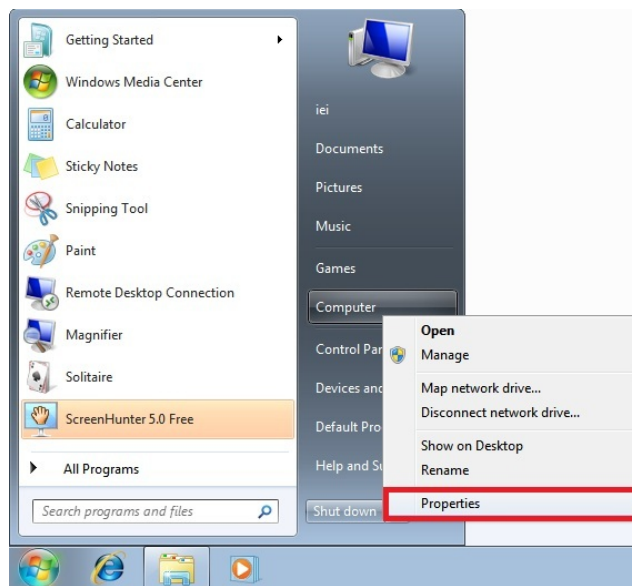


Figure 6-13: Windows Control Panel

**Step 2:** The system control panel window in **Figure 6-14** appears.

**Step 3:** Click the Device Manager link (**Figure 6-14**).

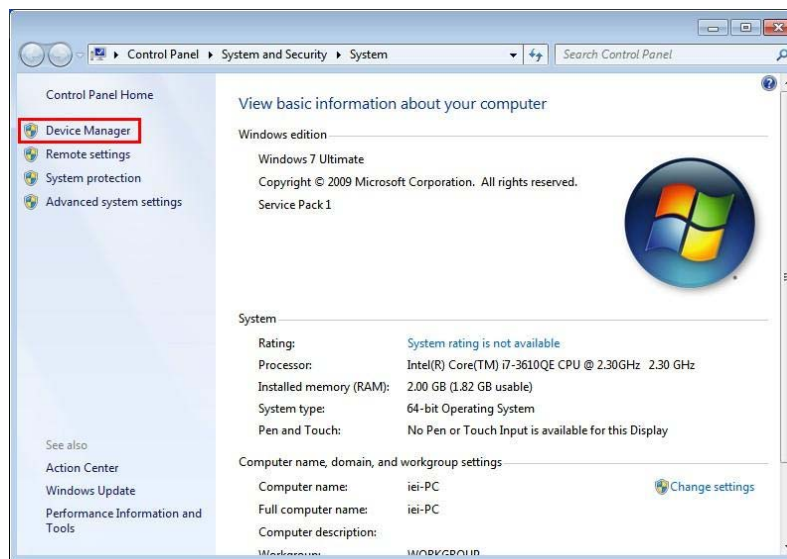
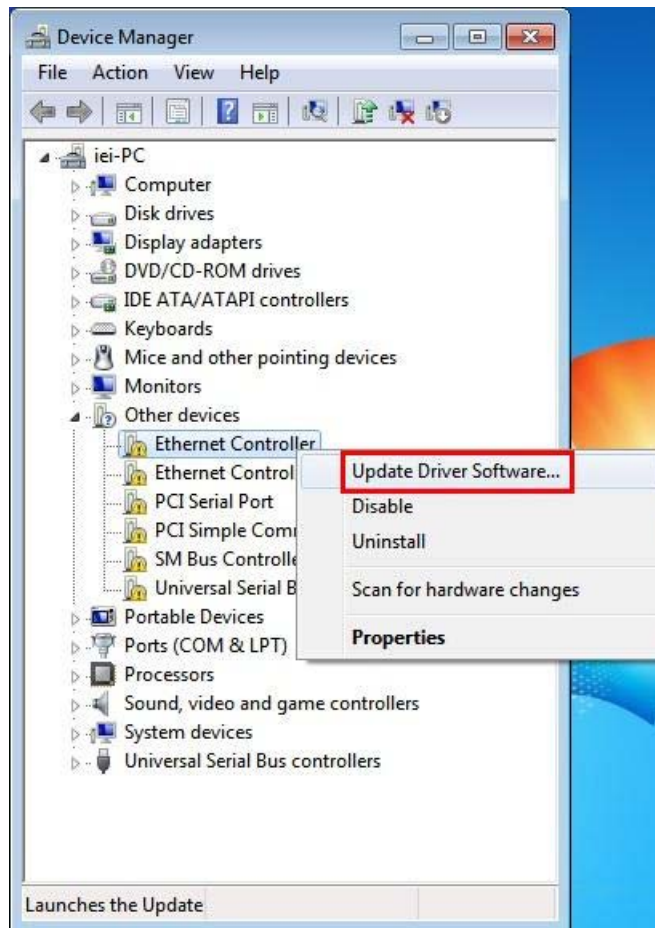


Figure 6-14: System Control Panel

**Step 4:** A list of system hardware devices appears (**Figure 6-15**).

**Step 5:** Right-click the Ethernet Controller that has question marks next to it (this means Windows does not recognize the device).

**Step 6:** Select **Update Driver Software**.



**Figure 6-15: Device Manager List**

**Step 7:** The Update Driver Software Window appears (**Figure 6-16**).

## KINO-DQM871-i1 Mini-ITX SBC

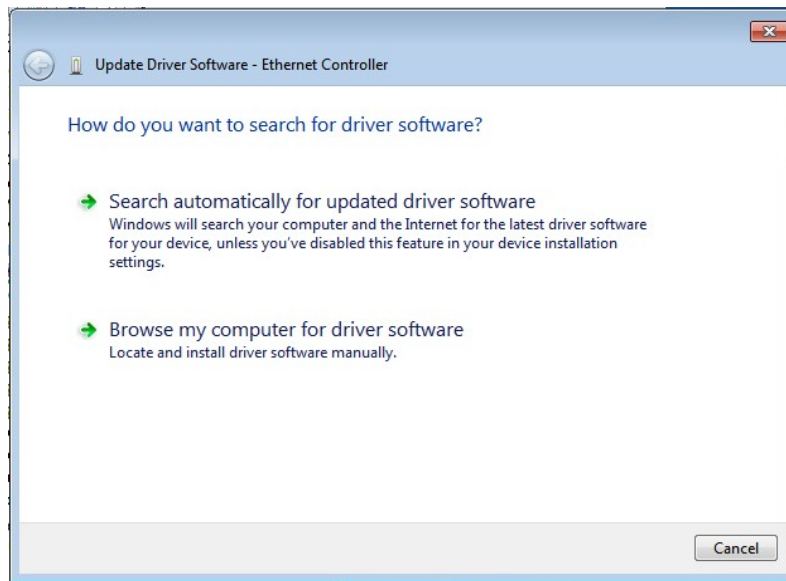


Figure 6-16: Update Driver Software Window

**Step 8:** Select “Browse my computer for driver software” and click **NEXT** to continue.

**Step 9:** Click Browse to select “X:\3-LAN” directory in the **Locate File** window, where “X:\” is the system CD drive. (Figure 6-17).

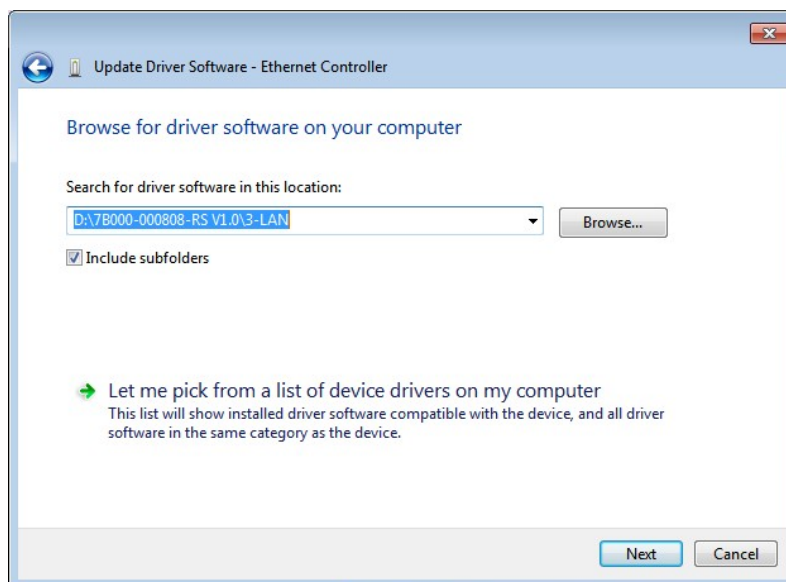
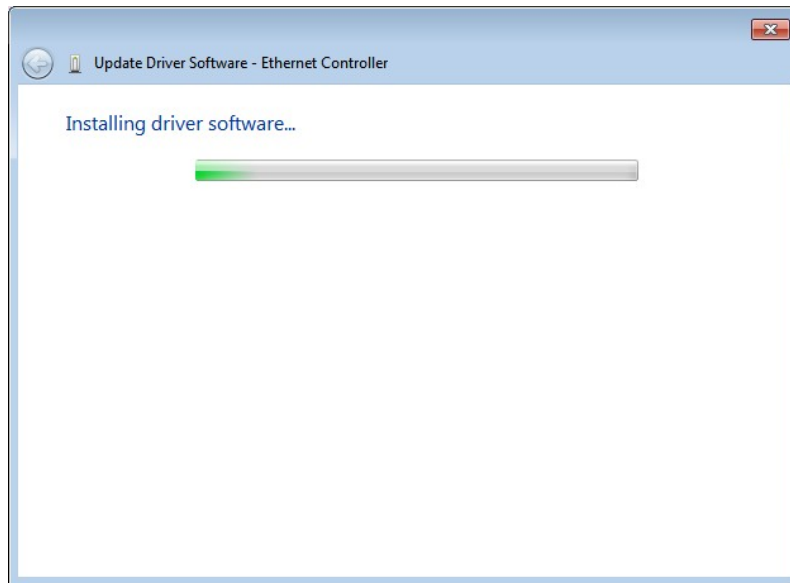


Figure 6-17: Locate Driver Files

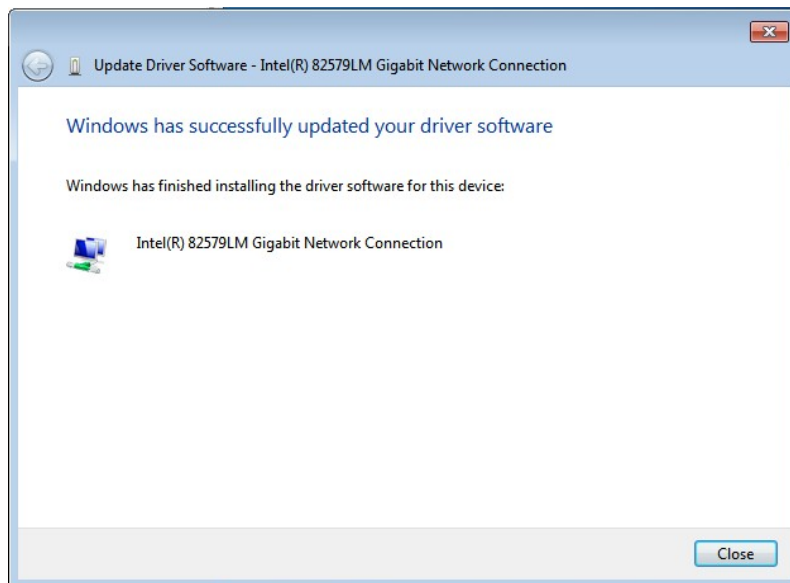
**Step 10:** Click **NEXT** to continue.

**Step 11:** Driver Installation is performed as shown in **Figure 6-18**.



**Figure 6-18: LAN Driver Installation**

**Step 12:** The **Finish** screen in **Figure 6-19** appears. Click **Close** to exit.



**Figure 6-19: LAN Driver Installation Complete**



## KINO-DQM871-i1 Mini-ITX SBC

## 6.6 USB 3.0 Driver Installation

**WARNING:**

Do not run this driver's installer (Setup.exe) from a USB storage device (ie. external USB hard drive or USB thumb drive). For proper installation, please copy driver files to a local hard drive folder and run from there.

To install the USB 3.0 driver, please follow the steps below.

**Step 1:** Access the driver list. (See **Section 6.2**)

**Step 2:** Click "**4-USB 3.0**".

**Step 3:** Locate the setup file and double click on it.

**Step 4:** The **Welcome Screen** in **Figure 6-20** appears.

**Step 5:** Click **Next** to continue.



**Figure 6-20: USB 3.0 Driver Welcome Screen**



**Step 6:** The license agreement in **Figure 6-21** appears.

**Step 7:** Read the **License Agreement**.

**Step 8:** Click **Yes** to continue.



**Figure 6-21: USB 3.0 Driver License Agreement**

**Step 9:** The **Read Me** file in **Figure 6-22** appears.

**Step 10:** Click **Next** to continue.

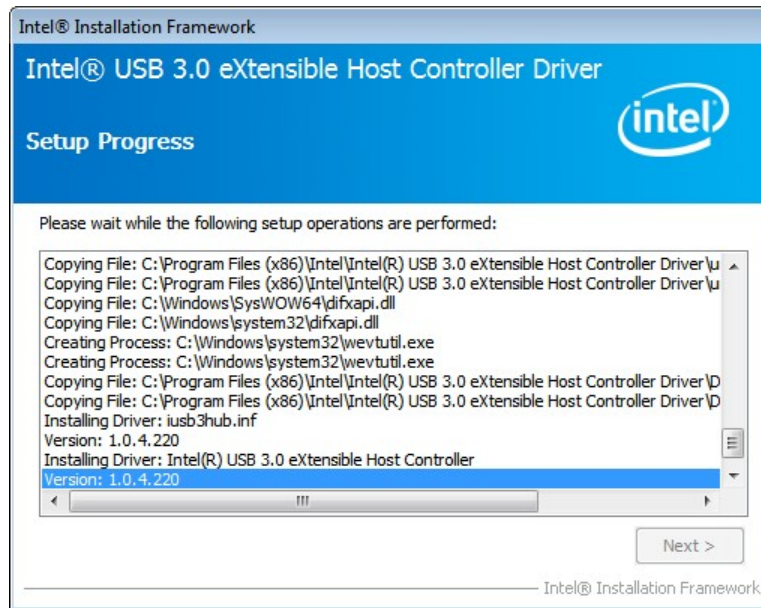


**Figure 6-22: USB 3.0 Driver Read Me File**

**KINO-DQM871-i1 Mini-ITX SBC**

**Step 11:** **Setup Operations** are performed as shown in **Figure 6-23**.

**Step 12:** Once the **Setup Operations** are complete, click **Next** to continue.



**Figure 6-23: USB 3.0 Driver Setup Operations**

**Step 13:** The **Finish** screen in **Figure 6-24** appears.

**Step 14:** Select “**Yes, I want to restart this computer now**” and click **Finish**.



**Figure 6-24: USB 3.0 Driver Installation Finish Screen**

## 6.7 Audio Driver Installation

To install the Audio driver, please do the following.

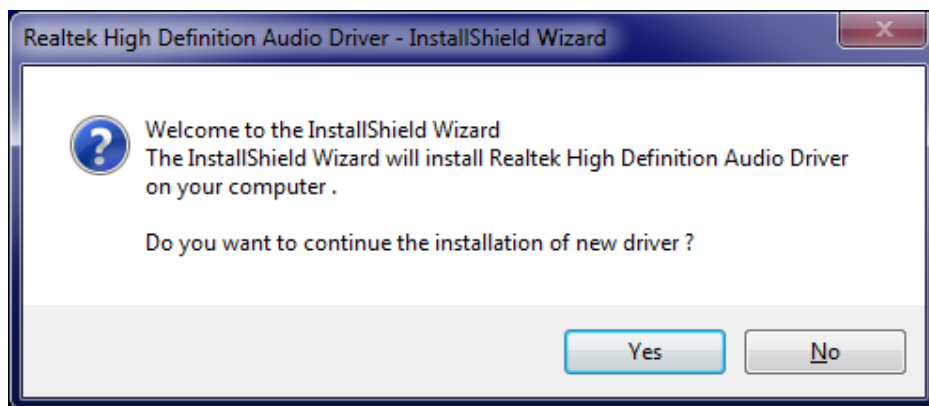
**Step 1:** Access the driver list. (See **Section 6.2**)

**Step 2:** Click “**5-Audio**” and select the folder which corresponds to the operating system.

**Step 3:** Double click the setup file.

**Step 4:** The **InstallShield Wizard** is prepared to guide the user through the rest of the process

**Step 5:** Once initialized, the **InstallShield Wizard** welcome screen appears (**Figure 6-25**).



**Figure 6-25: Audio Driver Welcome Screen**

**Step 6:** Click **Yes** to continue.

**Step 7:** The program begins to install. See **Figure 6-26**.

## KINO-DQM871-i1 Mini-ITX SBC

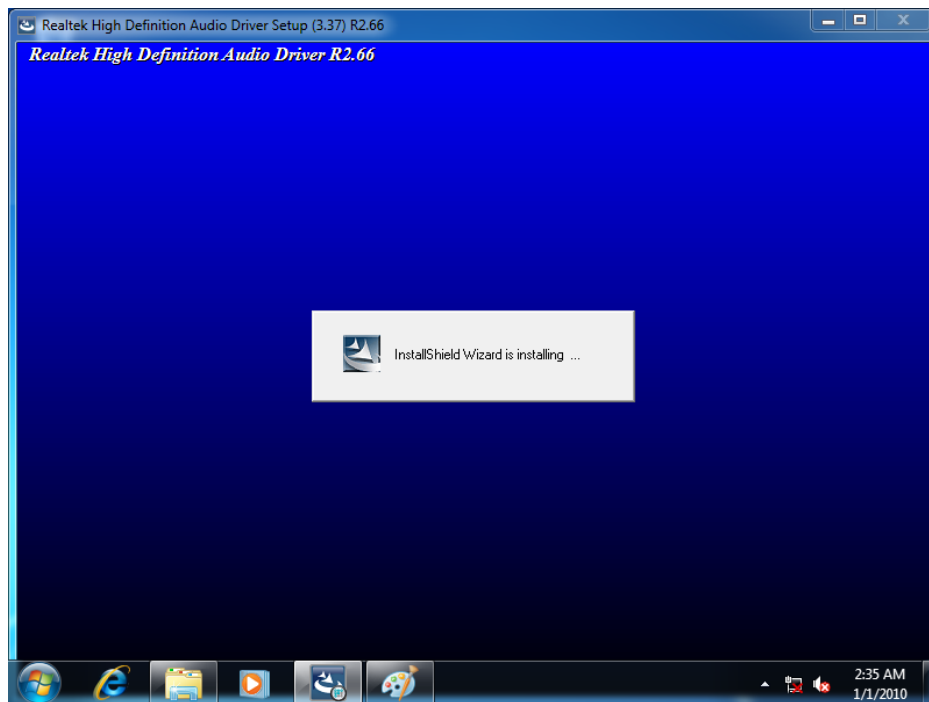


Figure 6-26: Audio Driver Installation

**Step 8:** When the driver installation is complete, the screen in **Figure 6-27** appears.

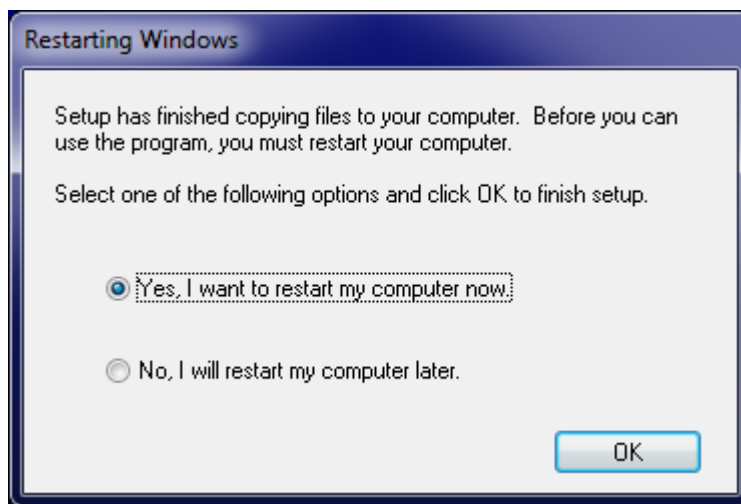


Figure 6-27: Audio Driver Installation Complete

**Step 9:** Select “Yes, I want to restart my computer now” and click **Finish**.

**Step 10:** The system reboots.



## 6.8 Intel® AMT Driver Installation

To install these Intel® AMT components, please do the following.

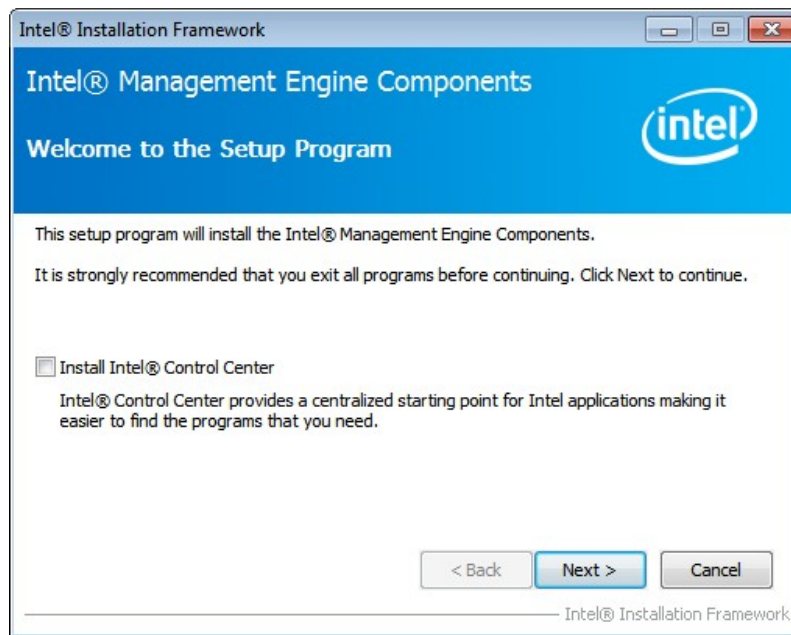
**Step 1:** Access the driver list. (See **Section 6.2**)

**Step 2:** Click “7-iAMT Driver & Utility”.

**Step 3:** Locate the setup file and double click it.

**Step 4:** When the setup files are completely extracted, the **Welcome Screen** in **Figure 6-28** appears.

**Step 5:** Click **Next** to continue.



**Figure 6-28: Intel® ME Driver Welcome Screen**

**Step 6:** The license agreement in **Figure 6-29** appears.

**Step 7:** Read the **License Agreement**.

**Step 8:** Click **Yes** to continue.



## KINO-DQM871-i1 Mini-ITX SBC

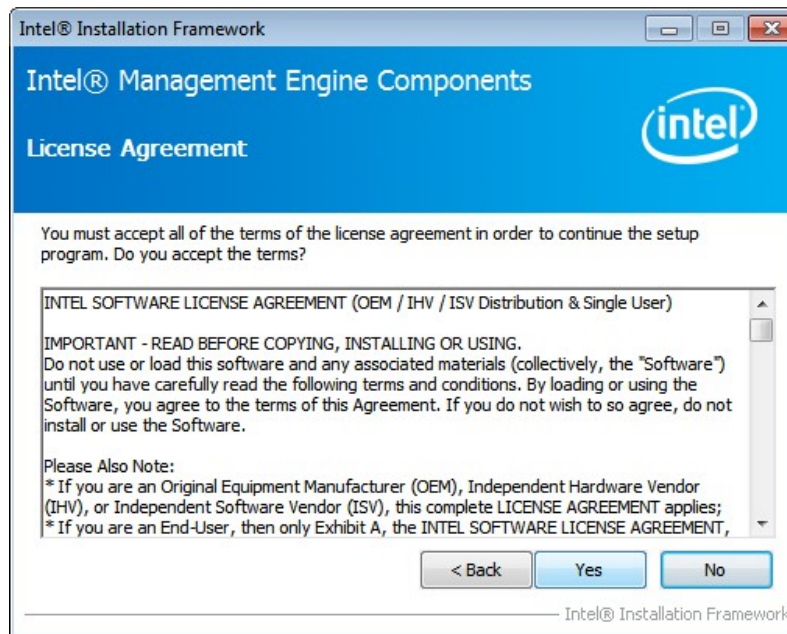


Figure 6-29: Intel® ME Driver License Agreement

**Step 9:** Setup Operations are performed as shown in Figure 6-30.

**Step 10:** Once the Setup Operations are complete, click **Next** to continue.

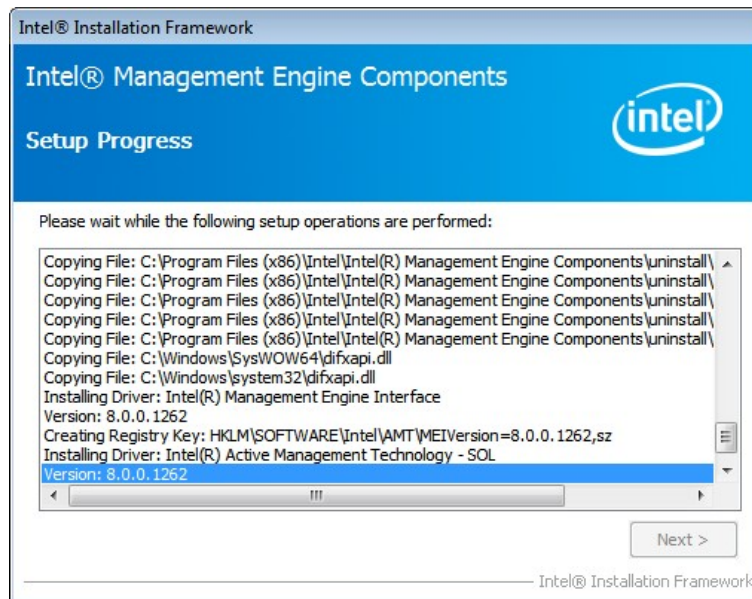
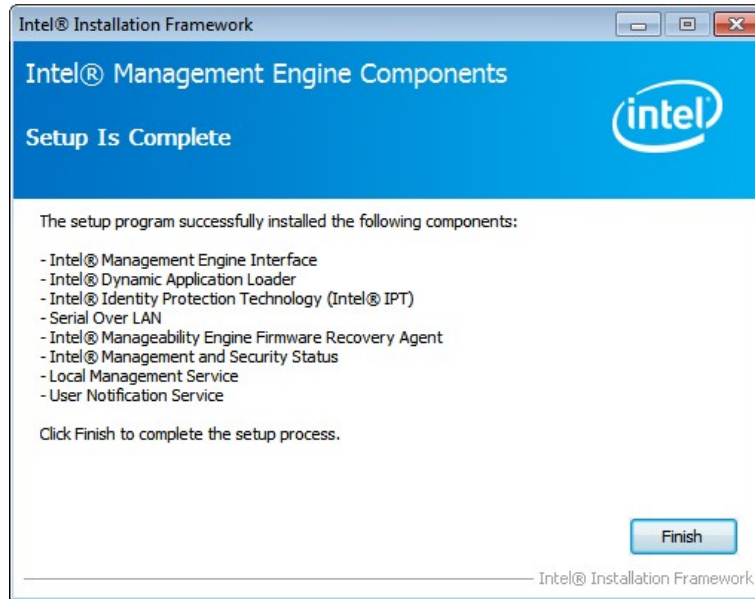


Figure 6-30: Intel® ME Driver Setup Operations

**Step 11:** The Finish screen in Figure 6-31 appears.

**Step 12:** Select “Yes, I want to restart this computer now” and click **Finish**.



**Figure 6-31: Intel® ME Driver Installation Finish Screen**

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**

# BIOS Options

---



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

<b>System Overview .....</b>	<b>82</b>
<b>System Date [xx/xx/xx] .....</b>	<b>82</b>
<b>System Time [xx:xx:xx] .....</b>	<b>82</b>
<b>ACPI Sleep State [S1 only (CPU Stop Clock)] .....</b>	<b>84</b>
<b>Wake system with Fixed Time [Disabled] .....</b>	<b>85</b>
<b>SATA Mode Selection [IDE] .....</b>	<b>89</b>
<b>Intel AMT [Enabled] .....</b>	<b>91</b>
<b>Un-Configure ME [Disabled] .....</b>	<b>92</b>
<b>USB Devices .....</b>	<b>92</b>
<b>Legacy USB Support [Enabled] .....</b>	<b>93</b>
<b>PC Health Status .....</b>	<b>94</b>
<b>CPU_FAN1/SYS_FAN1 Smart Fan Control [Auto Mode] .....</b>	<b>94</b>
<b>Change Settings [Auto] .....</b>	<b>96</b>
<b>Serial Port [Enabled] .....</b>	<b>97</b>
<b>Change Settings [Auto] .....</b>	<b>97</b>
<b>Serial Port [Enabled] .....</b>	<b>98</b>
<b>Change Settings [Auto] .....</b>	<b>98</b>
<b>Serial Port [Enabled] .....</b>	<b>99</b>
<b>Change Settings [Auto] .....</b>	<b>99</b>
<b>Serial Port [Enabled] .....</b>	<b>99</b>
<b>Change Settings [Auto] .....</b>	<b>100</b>
<b>Serial Port [Enabled] .....</b>	<b>100</b>
<b>Change Settings [Auto] .....</b>	<b>101</b>
<b>Console Redirection [Disabled] .....</b>	<b>102</b>
<b>Terminal Type [ANSI] .....</b>	<b>103</b>
<b>Bits per second [115200] .....</b>	<b>103</b>
<b>Data Bits [8] .....</b>	<b>103</b>
<b>Parity [None] .....</b>	<b>104</b>
<b>Stop Bits [1] .....</b>	<b>104</b>
<b>Auto Recovery Function [Disabled] .....</b>	<b>105</b>
<b>Restore AC Power Loss [Last State] .....</b>	<b>107</b>
<b>Detect Non-Compliance Device [Disabled] .....</b>	<b>109</b>
<b>Backlight Control Mode [CCFL] .....</b>	<b>112</b>

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<b>Bootup NumLock State [On].....</b>	<b>115</b>
<b>Quiet Boot [Enabled] .....</b>	<b>116</b>
<b>Option ROM Messages [Force BIOS].....</b>	<b>116</b>
<b>Launch PXE OpROM [Disabled] .....</b>	<b>116</b>
<b>UEFI Boot [Disabled] .....</b>	<b>116</b>
<b>Administrator Password .....</b>	<b>117</b>
<b>User Password .....</b>	<b>117</b>
<b>Save Changes and Reset .....</b>	<b>118</b>
<b>Discard Changes and Reset .....</b>	<b>118</b>
<b>Restore Defaults .....</b>	<b>118</b>
<b>Save as User Defaults .....</b>	<b>118</b>
<b>Restore User Defaults .....</b>	<b>118</b>

Appendix

C

# Terminology

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## KINO-DQM871-i1 Mini-ITX SBC

<b>ACPI</b>	Advanced Configuration and Power Interface (ACPI) is an OS-directed configuration, power management, and thermal management interface.
<b>AHCI</b>	Advanced Host Controller Interface (AHCI) is a SATA Host controller register-level interface.
<b>ATA</b>	The Advanced Technology Attachment (ATA) interface connects storage devices including hard disks and CD-ROM drives to a computer.
<b>ARMD</b>	An ATAPI Removable Media Device (ARMD) is any ATAPI device that supports removable media, besides CD and DVD drives.
<b>ASKIR</b>	Amplitude Shift Keyed Infrared (ASKIR) is a form of modulation that represents a digital signal by varying the amplitude ("volume") of the signal. A low amplitude signal represents a binary 0, while a high amplitude signal represents a binary 1.
<b>BIOS</b>	The Basic Input/Output System (BIOS) is firmware that is first run when the computer is turned on and can be configured by the end user
<b>CODEC</b>	The Compressor-Decompressor (CODEC) encodes and decodes digital audio data on the system.
<b>CompactFlash®</b>	CompactFlash® is a solid-state storage device. CompactFlash® devices use flash memory in a standard size enclosure. Type II is thicker than Type I, but a Type II slot can support both types.
<b>CMOS</b>	Complimentary metal-oxide-conductor is an integrated circuit used in chips like static RAM and microprocessors.
<b>COM</b>	COM refers to serial ports. Serial ports offer serial communication to expansion devices. The serial port on a personal computer is usually a male D-sub 9 connector.
<b>DAC</b>	The Digital-to-Analog Converter (DAC) converts digital signals to analog signals.
<b>DDR</b>	Double Data Rate refers to a data bus transferring data on both the rising and falling edges of the clock signal.

<b>DMA</b>	Direct Memory Access (DMA) enables some peripheral devices to bypass the system processor and communicate directly with the system memory.
<b>DIMM</b>	Dual Inline Memory Modules are a type of RAM that offer a 64-bit data bus and have separate electrical contacts on each side of the module.
<b>DIO</b>	The digital inputs and digital outputs are general 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.
<b>EHCI</b>	The Enhanced Host Controller Interface (EHCI) specification is a register-level interface description for USB 2.0 Host Controllers.
<b>EIDE</b>	Enhanced IDE (EIDE) is a newer IDE interface standard that has data transfer rates between 4.0 MBps and 16.6 MBps.
<b>EIST</b>	Enhanced Intel® SpeedStep Technology (EIST) allows users to modify the power consumption levels and processor performance through application software. The application software changes the bus-to-core frequency ratio and the processor core voltage.
<b>FSB</b>	The Front Side Bus (FSB) is the bi-directional communication channel between the processor and the Northbridge chipset.
<b>GbE</b>	Gigabit Ethernet (GbE) is an Ethernet version that transfers data at 1.0 Gbps and complies with the IEEE 802.3-2005 standard.
<b>GPIO</b>	General purpose input
<b>HDD</b>	Hard disk drive (HDD) is a type of magnetic, non-volatile computer storage device that stores digitally encoded data.
<b>ICH</b>	The Input/Output Control Hub (ICH) is an Intel® Southbridge chipset.
<b>IrDA</b>	Infrared Data Association (IrDA) specify infrared data transmission protocols used to enable electronic devices to wirelessly communicate with each other.
<b>L1 Cache</b>	The Level 1 Cache (L1 Cache) is a small memory cache built into the system processor.
<b>L2 Cache</b>	The Level 2 Cache (L2 Cache) is an external processor memory cache.



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<b>LCD</b>	Liquid crystal display (LCD) is a flat, low-power display device that consists of two polarizing plates with a liquid crystal panel in between.
<b>LVDS</b>	Low-voltage differential signaling (LVDS) is a dual-wire, high-speed differential electrical signaling system commonly used to connect LCD displays to a computer.
<b>POST</b>	The Power-on Self Test (POST) is the pre-boot actions the system performs when the system is turned-on.
<b>RAM</b>	Random Access Memory (RAM) is volatile memory that loses data when power is lost. RAM has very fast data transfer rates compared to other storage like hard drives.
<b>SATA</b>	Serial ATA (SATA) is a serial communications bus designed for data transfers between storage devices and the computer chipsets.
<b>S.M.A.R.T</b>	Self Monitoring Analysis and Reporting Technology (S.M.A.R.T) refers to automatic status checking technology implemented on hard disk drives.
<b>UART</b>	Universal Asynchronous Receiver-transmitter (UART) is responsible for asynchronous communications on the system and manages the system's serial communication (COM) ports.
<b>UHCI</b>	The Universal Host Controller Interface (UHCI) specification is a register-level interface description for USB 1.1 Host Controllers.
<b>USB</b>	The Universal Serial Bus (USB) is an external bus standard for interfacing devices. USB 1.1 supports 12 Mbit/s data transfer rates, USB 2.0 supports 480 Mbit/s data transfer rates and USB 3.0 supports 5 Gbit/s data transfer rates and.
<b>VGA</b>	The Video Graphics Array (VGA) is a graphics display system developed by IBM.

**Appendix**

**D**

# Digital I/O Interface

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## KINO-DQM871-i1 Mini-ITX SBC

### D.1 Introduction

The DIO connector on the KINO-DQM871-i1 is interfaced to GPIO ports on the Super I/O chipset. The DIO has both 4-bit digital inputs and 4-bit digital outputs. 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.

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### D.2 DIO Connector Pinouts

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	+V5S
3	Output 3	4	Output 2
5	Output 1	6	Output 0
7	Input 3	8	Input 2
9	Input 1	10	Input 0

**Table 6-1: Digital I/O Connector Pinouts**

## D.3 Assembly Language Samples

### D.3.1 Enable the DIO Input Function

The BIOS interrupt call INT 15H controls the digital I/O. An assembly program to enable digital I/O input functions is listed below.

<b>MOV</b>	<b>AX, 6F08H</b>	Sets the digital port as input
<b>INT</b>	<b>15H</b>	Initiates the INT 15H BIOS call

### D.3.2 Enable the DIO Output Function

The BIOS interrupt call INT 15H controls the digital I/O. An assembly program to enable digital I/O output functions is listed below.

<b>MOV</b>	<b>AX, 6F09H</b>	Sets the digital port as output
<b>MOV</b>	<b>BL, 09H</b>	
<b>INT</b>	<b>15H</b>	Initiates the INT 15H BIOS call

Appendix

E

# Watchdog Timer

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**NOTE:**

The following discussion applies to DOS. Contact IEI support or visit the IEI website for drivers for other operating systems.

The Watchdog Timer is a hardware-based timer that attempts to restart the system when it stops working. The system may stop working because of external EMI or software bugs. The Watchdog Timer ensures that standalone systems like ATMs will automatically attempt to restart in the case of system problems.

A BIOS function call (INT 15H) is used to control the Watchdog Timer.

INT 15H:

AH – 6FH Sub-function:	
AL – 2:	Sets the Watchdog Timer's period.
BL:	Time-out value (Its unit-second is dependent on the item "Watchdog Timer unit select" in CMOS setup).

**Table E-1: AH-6FH Sub-function**

Call sub-function 2 to set the time-out period of Watchdog Timer first. If the time-out value is not zero, the Watchdog Timer starts counting down. When the timer value reaches zero, the system resets. To ensure that this reset condition does not occur, calling sub-function 2 must periodically refresh the Watchdog Timer. However, the watchdog timer is disabled if the time-out value is set to zero.

A tolerance of at least 10% must be maintained to avoid unknown routines within the operating system (DOS), such as disk I/O that can be very time-consuming.

## KINO-DQM871-i1 Mini-ITX SBC

**NOTE:**

The Watchdog Timer is activated through software. The software application that activates the Watchdog Timer must also deactivate it when closed. If the Watchdog Timer is not deactivated, the system will automatically restart after the Timer has finished its countdown.

**EXAMPLE PROGRAM:**

**; INITIAL TIMER PERIOD COUNTER**

;

**W\_LOOP:**

;

```

MOV      AX, 6F02H      ;setting the time-out value
MOV      BL, 30          ;time-out value is 48 seconds
INT      15H

```

;

**; ADD THE APPLICATION PROGRAM HERE**

;

```

CMP      EXIT_AP, 1      ;is the application over?
JNE      W_LOOP          ;No, restart the application

```

```

MOV      AX, 6F02H      ;disable Watchdog Timer
MOV      BL, 0           ;
INT      15H

```

;

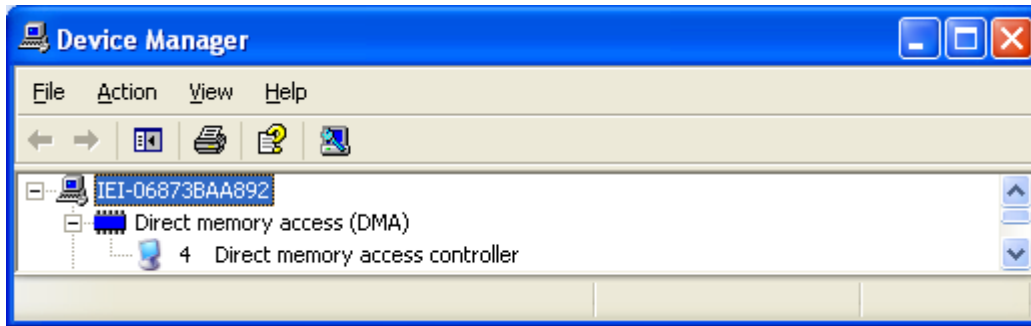
**; EXIT ;**

**Appendix**

**F**

# **Address Mapping**

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**KINO-DQM871-i1 Mini-ITX SBC****F.1 Direct Memory Access (DMA)****Figure F-1: Direct Memory Access (DMA)**

## F.2 Input/Output (IO)

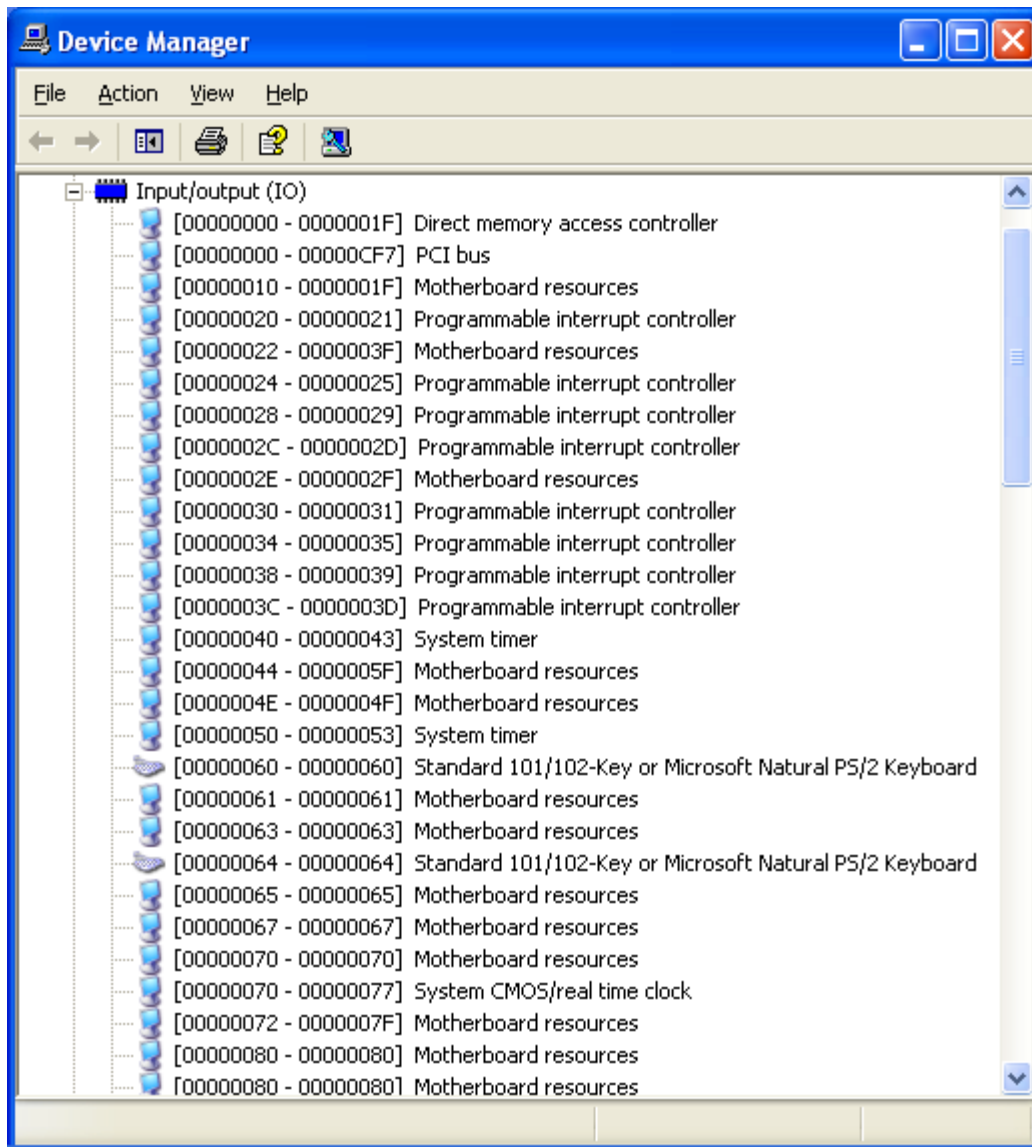


Figure F-2: Input/Output (IO) (1 of 3)



## KINO-DQM871-i1 Mini-ITX SBC

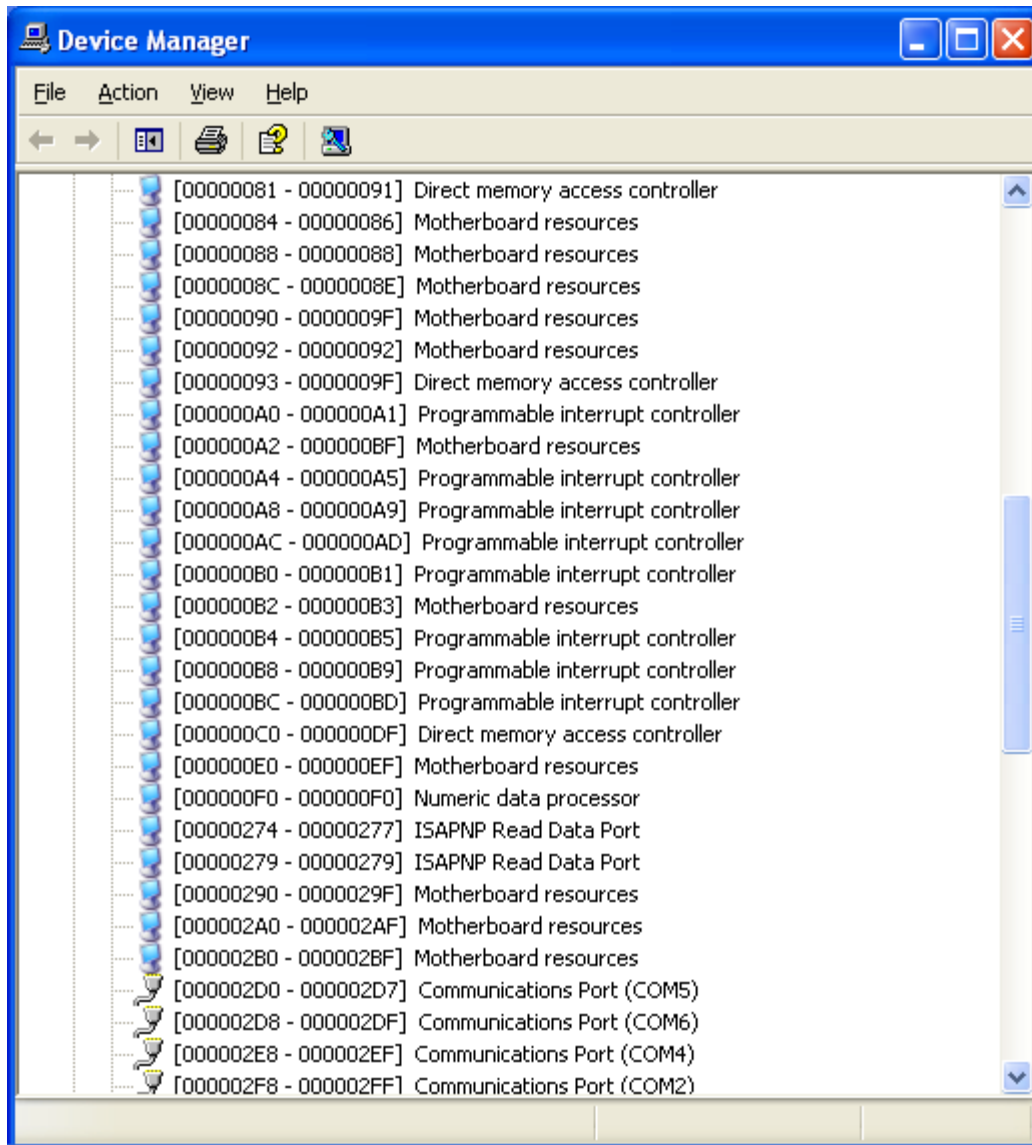
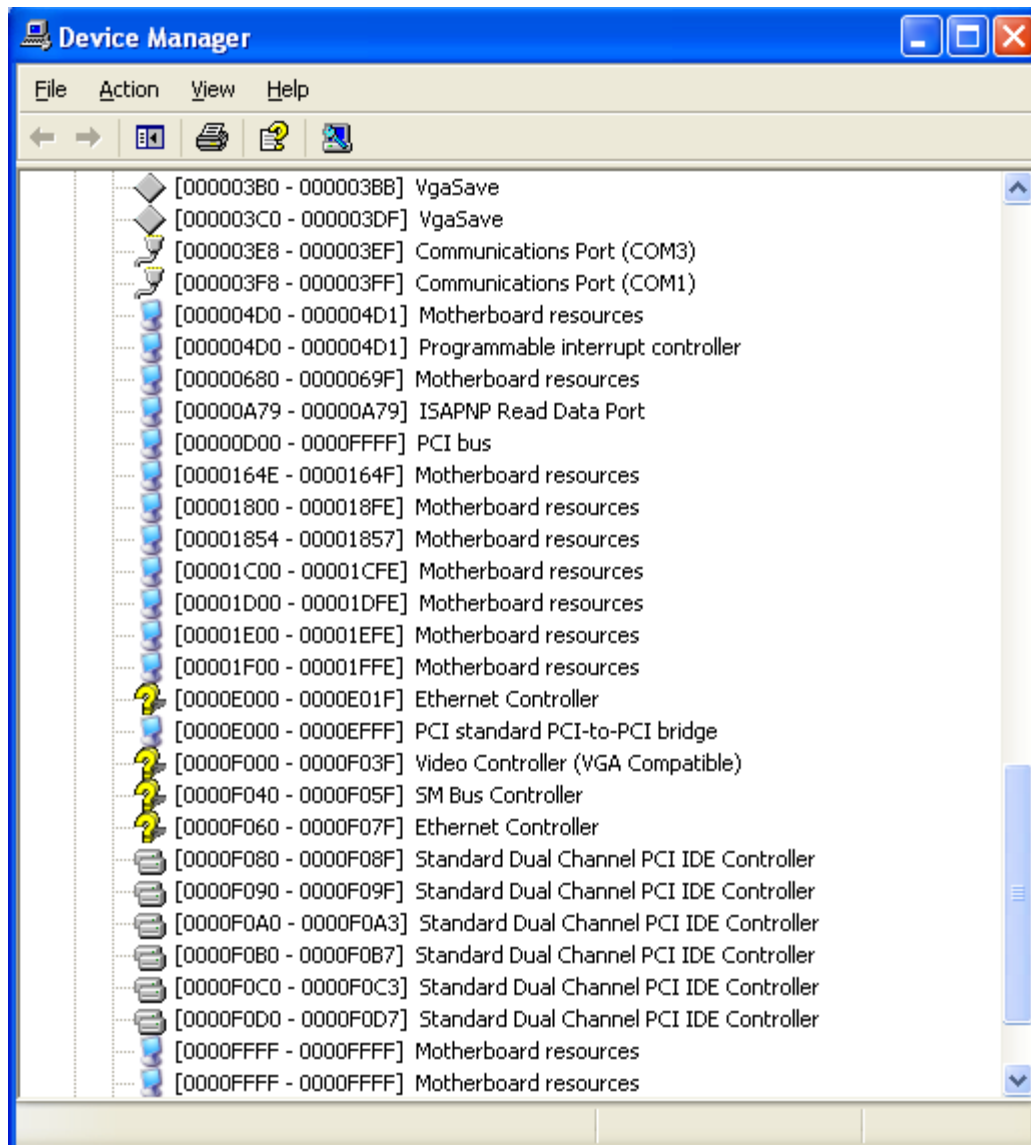


Figure F-3: Input/Output (IO) (2 of 3)



**Figure F-4: Input/Output (IO) (3 of 3)**

## KINO-DQM871-i1 Mini-ITX SBC

## F.3 Interrupt Request (IRQ)

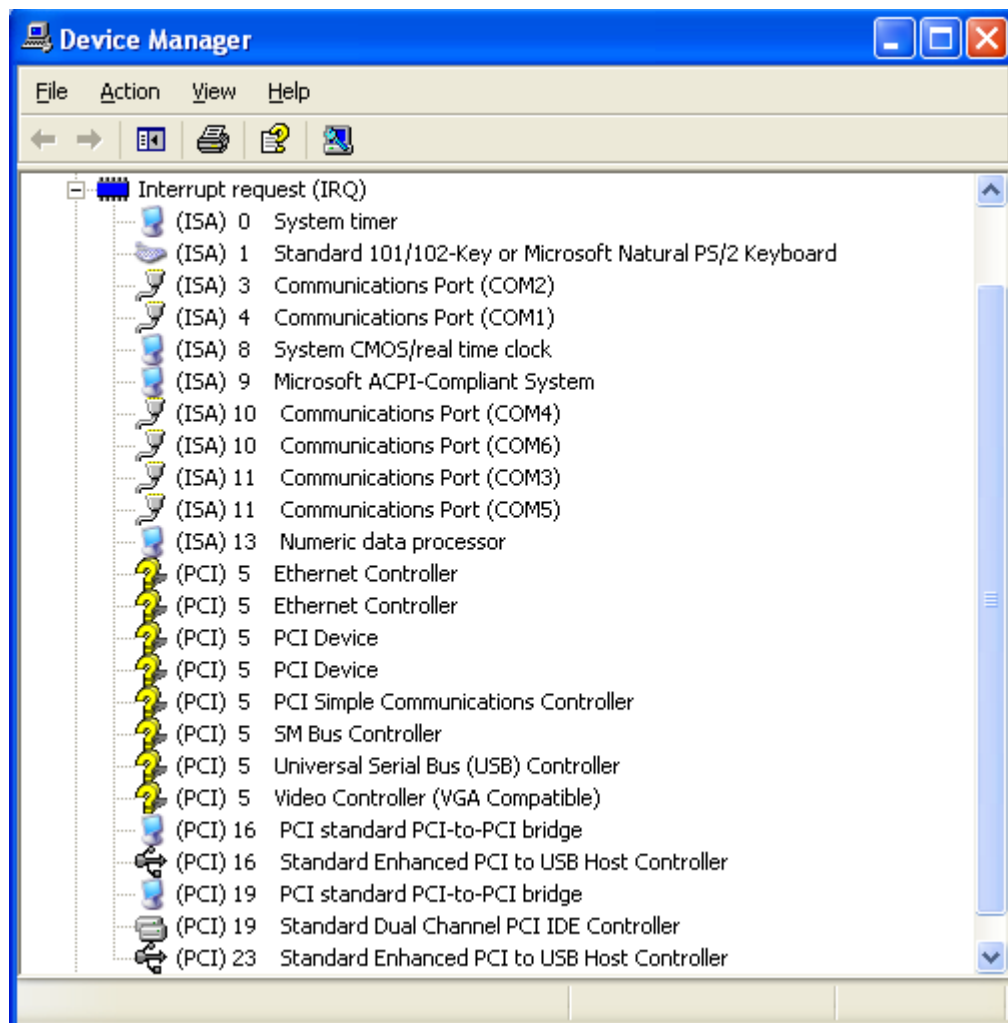
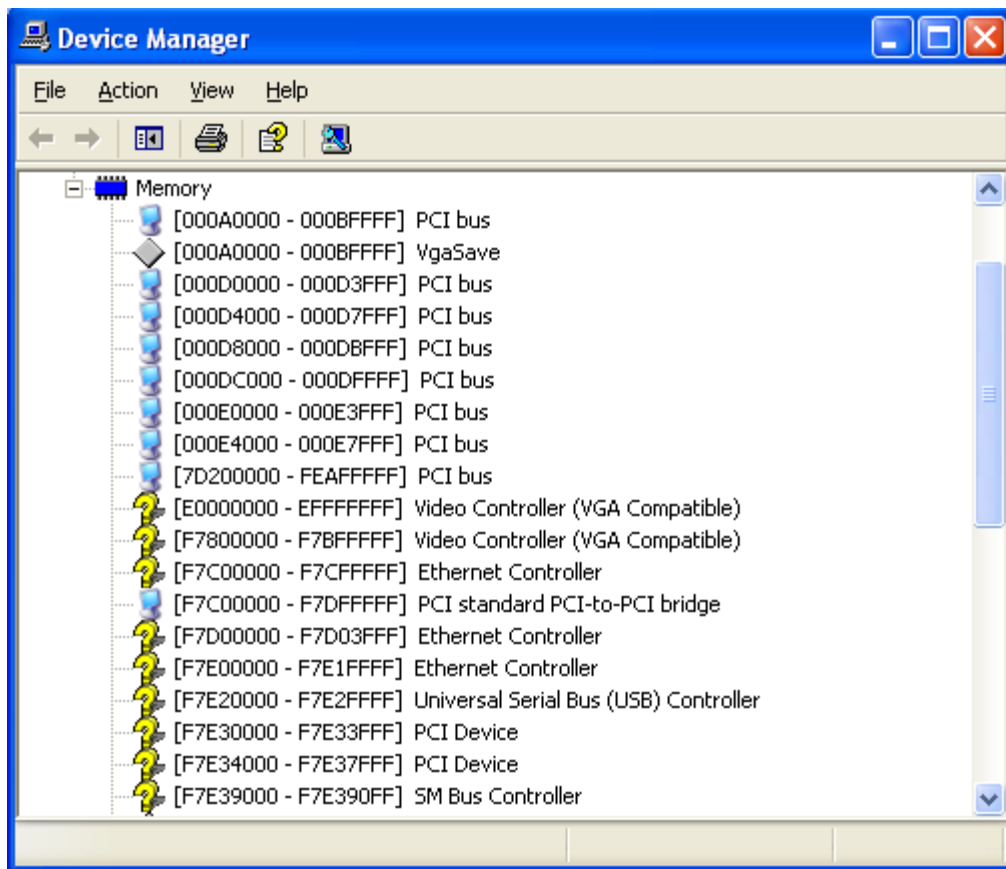


Figure F-5: Interrupt Request (IRQ)

## F.4 Memory



**Figure F-6: Memory (1 of 2)**

## KINO-DQM871-i1 Mini-ITX SBC

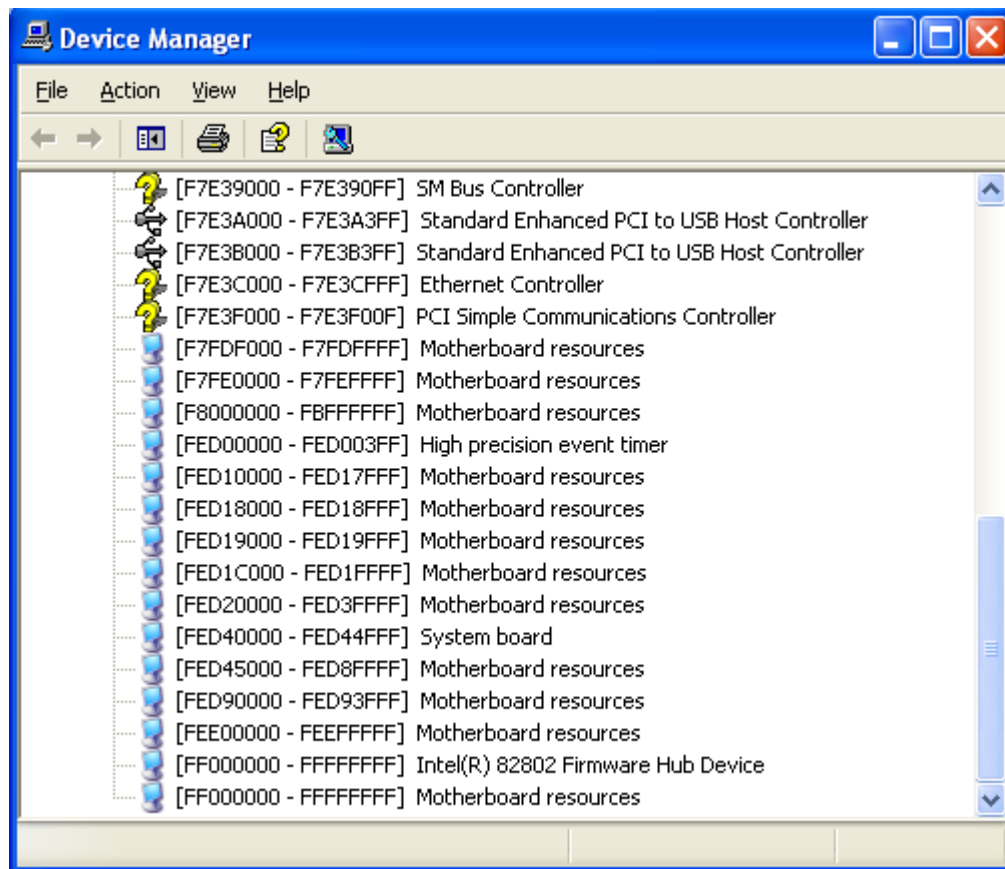


Figure F-7: Memory (2 of 2)



Appendix

**G**

# Hazardous Materials Disclosure

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## **G.1 Hazardous Materials Disclosure Table for IPB Products Certified as RoHS Compliant Under 2002/95/EC Without Mercury**

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 the table on the next page.



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
<p>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</p> <p>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</p>						



## KINO-DQM871-i1 Mini-ITX SBC

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	○	○	○	○	○	○
显示	○	○	○	○	○	○
印刷电路板	○	○	○	○	○	○
金属螺帽	○	○	○	○	○	○
电缆组装	○	○	○	○	○	○
风扇组装	○	○	○	○	○	○
电力供应组装	○	○	○	○	○	○
电池	○	○	○	○	○	○
○: 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/T11363-2006 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/T11363-2006 标准规定的限量要求。						