

MODEL:

KINO-CV-D25501/N26001

**Mini-ITX SBC with Intel® Atom™ D2550/N2600 Processor
Up to 4.0 GB DDR3, VGA, HDMI, Dual LVDS, Dual GbE,
SATA 3Gb/s, USB 3.0, microSD, PCIe Mini, RoHS**

User Manual

Revision

Date	Version	Changes
December 22, 2014	1.04	Deleted SMBus connector information Modified Ethernet port information
September 22, 2014	1.03	Modified Figure 3-1: Connector and Jumper Locations
May 12, 2014	1.02	Modified Table 3-23: LAN1 Pinouts
October 8, 2013	1.01	Updated the dual USB cable information in the packing list.
July 23, 2012	1.00	Initial release

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Chapter

1

Introduction

1.1 Introduction

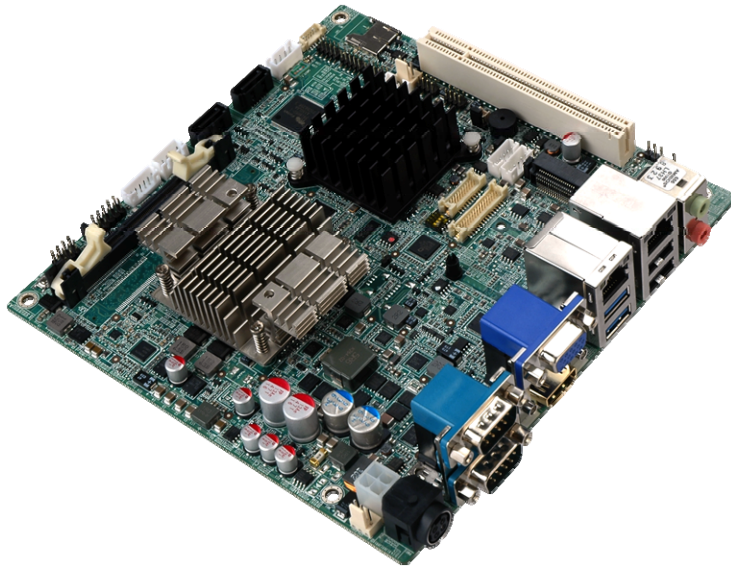


Figure 1-1: KINO-CV-D25501/N26001

The KINO-CV-D25501/N26001 is a Mini-ITX SBC with a Intel® Atom™ processor D2550 or N2600. The KINO-CV-D25501/N26001 is designed for fanless operation. The low power CPUs don't require active cooling and stay within specified heat range using the included heatsink.

Storage on the board is handled by a SATA 3Gb/s port for connecting a hard drive, optical drive or SSD. The PCIe Mini slot allows an mSATA card to be installed. A bootable microSD card can be installed into the on-board microSD slot.

The board has three types of graphics output. A VGA output connects to a traditional VGA monitor, one HDMI connector supports HDMI display and two LVDS connectors support 18-bit/24-bit displays.

Other slots and connectors include a PCIe Mini cards slot, PCI slot, RS-232, RS-422/485, Gigabit Ethernet, USB 3.0 ports, USB 2.0 ports and digital I/O.

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1.2 Benefits

Some of the KINO-CV-D25501/N26001 motherboard benefits include:

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

1.3 Features

Some of the KINO-CV-D25501/N26001 motherboard features are listed below:

- Mini-ITX form factor
- Fanless design
- RoHS compliant
- Supports HDMI, LVDS and VGA interface for dual display
- Wide range power input (9 V – 28 V)
- Eight USB ports (six USB 2.0, two USB 3.0)
- Six serial ports
- PCIe Mini card slot supports mSATA SSD
- microSD slot
- Dual GbE

1.4 Connectors

The connectors on the KINO-CV-D25501/N26001 are shown in the figure below.

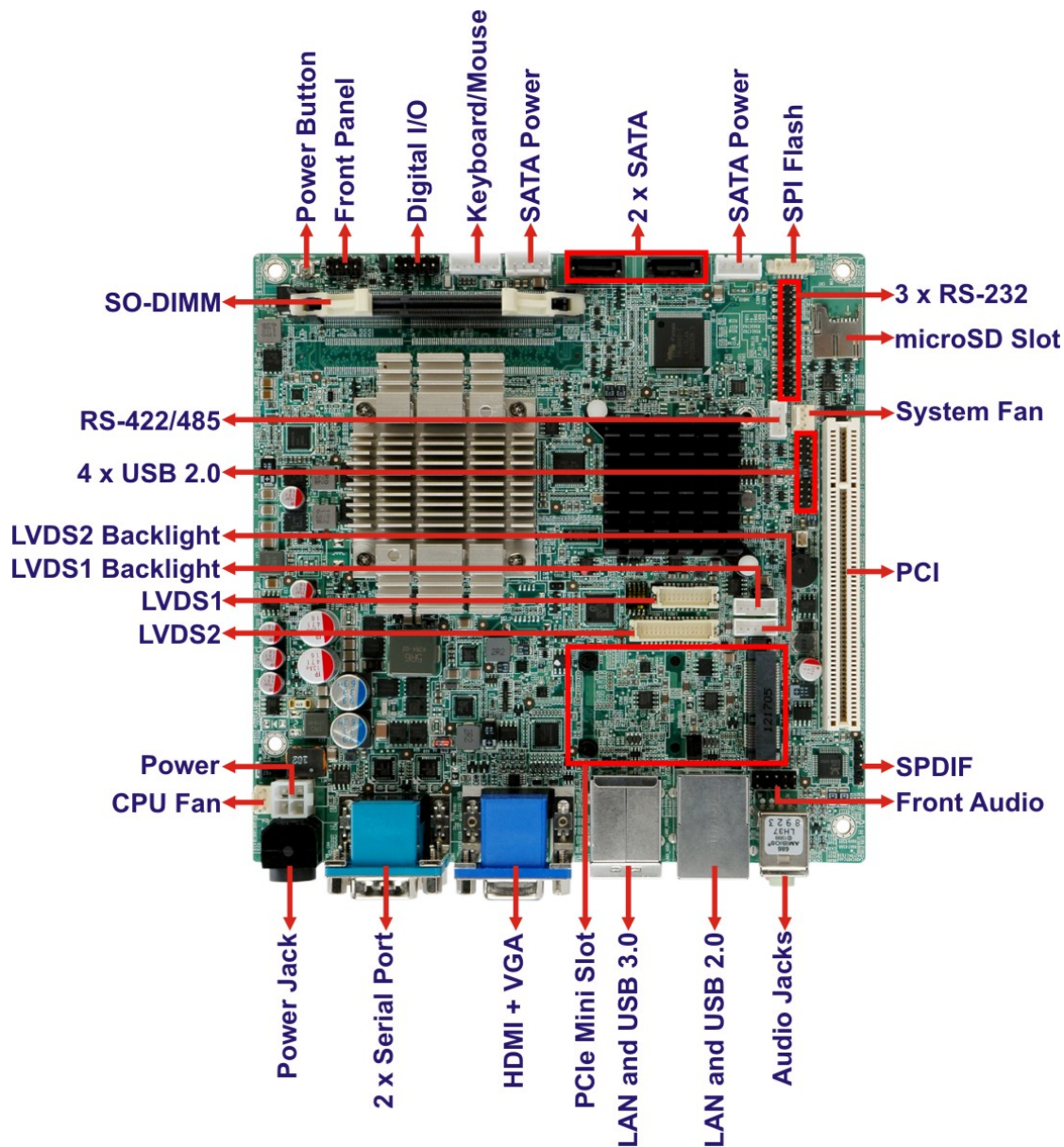


Figure 1-2: Connectors

KINO-CV-D25501/N26001 SBC

1.5 Dimensions

The main dimensions of the KINO-CV-D25501/N26001 are shown in the diagram below.

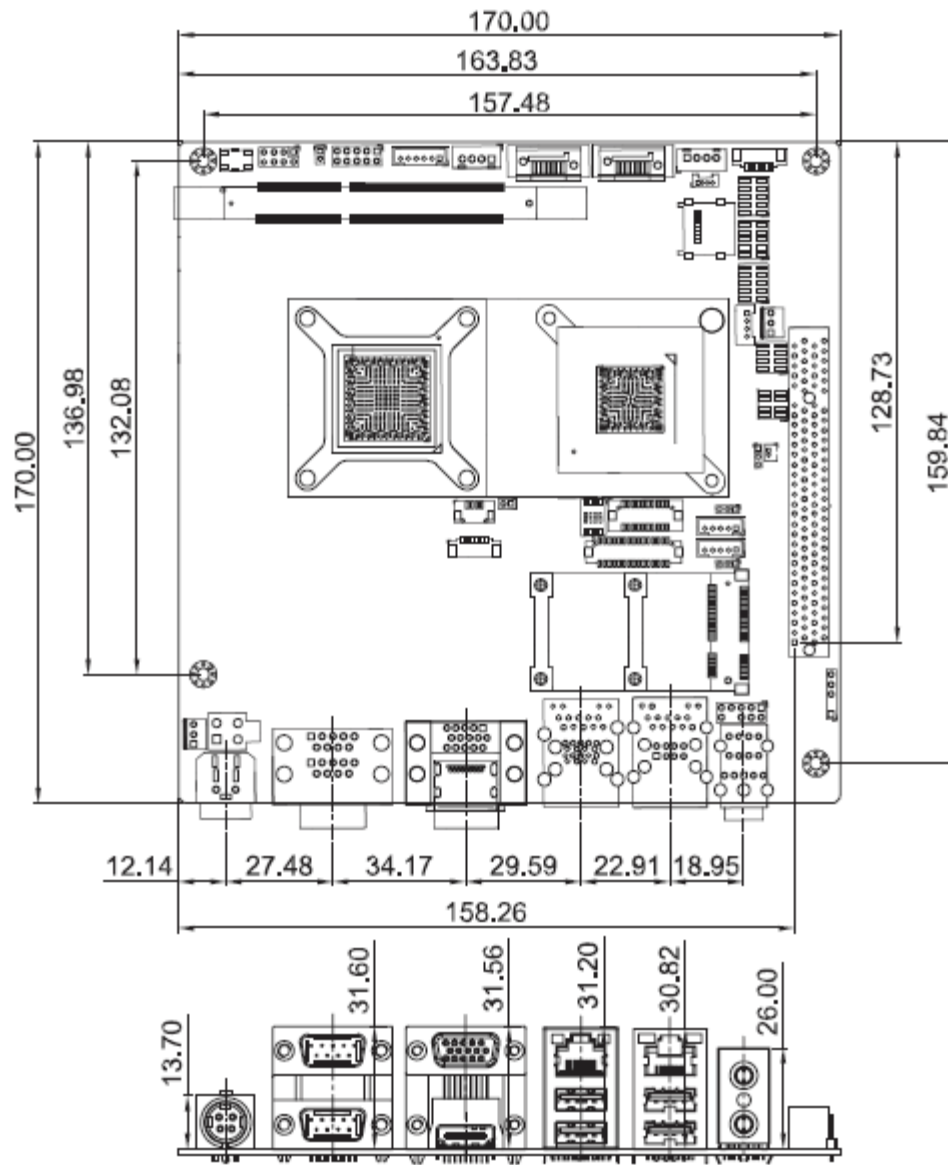


Figure 1-3: Dimensions (mm)

1.6 Data Flow

Figure 1-4 shows the data flow between the system chipset, the CPU and other components installed on the motherboard.

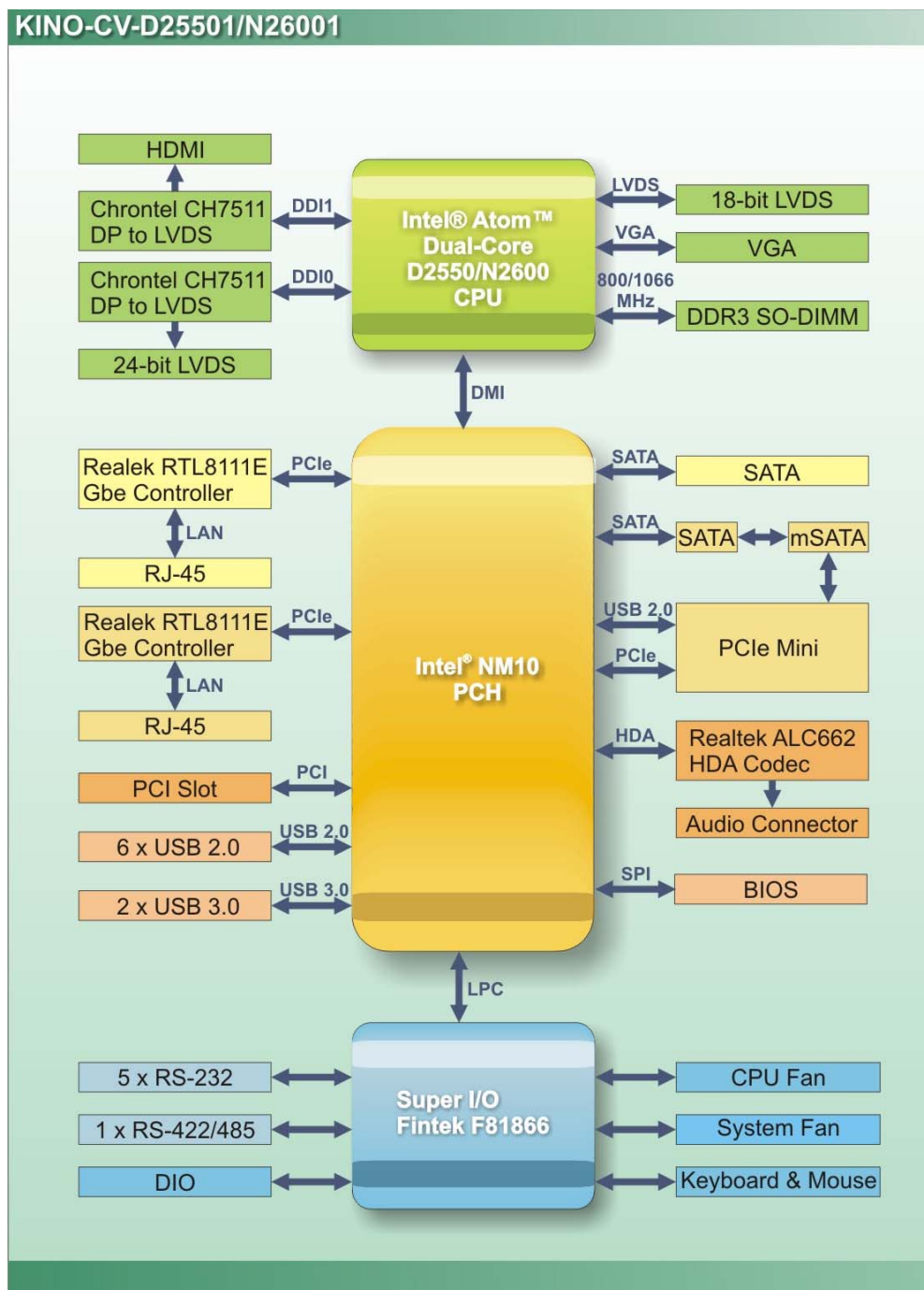


Figure 1-4: Data Flow Diagram

KINO-CV-D25501/N26001 SBC**1.7 Technical Specifications**

KINO-CV-D25501/N26001 technical specifications are listed in Table 1-1.

Specification	KINO-CV-D25501/N26001
Form Factor	Mini-ITX
On-board CPU	1.86 GHz Intel® Atom™ D2550 dual-core CPU 1.60 GHz Intel® Atom™ N2600 dual-core CPU 1.86 GHz Intel® Atom™ N2800 dual-core CPU (optional)
System Chipset	Intel® NM10
Memory	D2550 and N2800 : One 204-pin 1066 MHz DDR3/DDR3L (1.35V) SDRAM SO-DIMM (system max. 4.0 GB) N2600 : One 204-pin 800 MHz DDR3/DDR3L (1.35V) SDRAM SO-DIMM (system max. 2.0 GB)
Graphics Engine	D2550 and N2800 : Intel® GMA3650 with 640 MHz graphic core speed N2600 : Intel® GMA3600 with 400 MHz graphic core speed
BIOS	UEFI BIOS
Digital I/O	8-bit, 4-bit input/4-bit output
Ethernet Controllers	Two Realtek RTL8111E PCIe GbE controllers (LAN1 supports ASF 2.0)
Audio	Realtek ALC662 HD Audio codec
Super I/O Controller	Fintek F81866
Watchdog Timer	Software programmable supports 1 sec – 255 sec system reset
Expansions	1 x PCIe Mini slot supports mSATA SSD ((SATA2 and mSATA share SATA signal)) 1 x PCI slot



I/O Interface Connectors	
Display Output Ports (Dual Display Supported)	One Analog CRT (up to 2048 x 1536 @ 75 Hz) One HDMI (up to 1920 x 1200 @ 60 Hz) One LVDS 1: <ul style="list-style-type: none">▪ D2550: 24-bit single-channel LVDS up to 1440 x 900▪ N2600 and N2800: 18-bit single-channel LVDS up to 1366 x 768 One LVDS 2: 24-bit dual-channel LVDS by Chrontel CH7511 DP to LVDS converter
Fan Connectors	One 3-pin wafer for CPU fan One 3-pin wafer for system fan
Keyboard/Mouse	One internal 6-pin wafer connector
Serial Ports	Five RS-232 COM connectors One RS-422/485 COM connector
USB Ports	Six USB 2.0 (four via pin header, two external ports) Two external USB 3.0 ports
Storage	
microSD	microSD slot (bootable)
SATA	Two independent SATA channels with 3.0 Gb/s data transfer rates (SATA2 and mSATA share SATA signal)
Environmental and Power Specifications	
Power Supply	Max. power input voltage range: 9 V – 28 V Recommended operating input voltage range: 12 V – 24 V
Power Connector	1 x External 4-pin DIN jack 1 x Internal 4-pin (2x2) power connector
Power Consumption	12 V @ 2.8 A (1.86 GHz Intel® Atom™ processor D2550 with one 4 GB 1333 MHz DDR3 SO-DIMM) 12 V @ 2.4 A (1.6 GHz Intel® Atom™ processor N2600 with one 2 GB 1333 MHz DDR3 SO-DIMM)



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Operating Temperature	D2550: -20°C – 60°C with free air; -20°C – 70°C with force air N2600 and N2800: -20°C – 70°C with free air; -20°C – 75°C with force air
Storage Temperature	D2550: -30°C – 80°C N2600 and N2800: -30°C – 85°C
Operating Humidity	5% – 95% (non-condensing)
Physical Specifications	
Dimensions	170 mm x 170 mm
Weight GW/NW	600 g/250 g

Table 1-1: Technical Specifications

Chapter

2

Packing List

2.1 Anti-static Precautions



WARNING!

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

Make sure to adhere to the following guidelines:

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

2.2 Unpacking Precautions

When the KINO-CV-D25501/N26001 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.

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-CV-D25501/N26001 was purchased from or contact an IEI sales representative directly by sending an email to sales@ieiworld.com

The KINO-CV-D25501/N26001 is shipped with the following components:

Quantity	Item and Part Number	Image
1	KINO-CV-D25501 or KINO-CV-N26001	
2	SATA and power cable (P/N: 32801-000100-300-RS)	
1	Dual USB cable (w bracket) (P/N: 19800-003000-200-RS)	
1	I/O shielding (P/N: 45014-0038C0-00-RS)	
1	Mini jumper pack (2.0mm) (P/N: 33101-000657-RS)	
1	Utility CD	

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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
RS-422/485 cable (P/N: 32205-003800-300-RS)	
KB/MS PS/2 Y-cable (P/N: 32000-023800-RS)	

Table 2-2: Optional Items

Chapter

3

Connector Pinouts

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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.

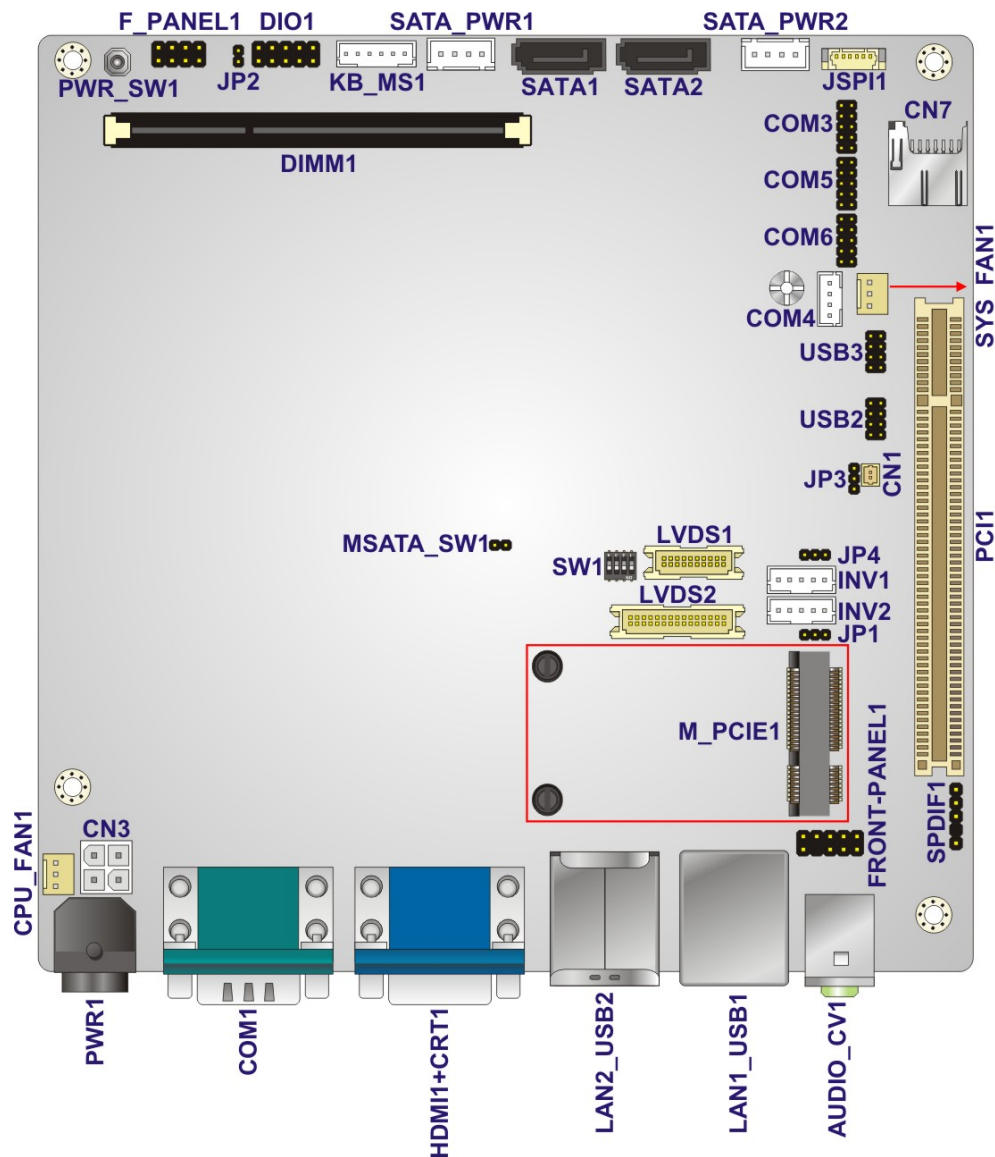


Figure 3-1: Connector and Jumper Locations



3.1.2 Peripheral Interface Connectors

The table below shows a list of the peripheral interface connectors on the KINO-CV-D25501/N26001. Detailed descriptions of these connectors can be found below.

Connector	Type	Label
Battery connector	2-pin wafer	CN1
Digital I/O connector	10-pin header	DIO1
Fan connectors	3-pin wafer	CPU_FAN1, SYS_FAN1
Front audio connector	10-pin header	FRONT-PANEL1
Front panel connector	8-pin header	F_PANEL1
Keyboard/mouse connector	6-pin wafer	KB_MS1
LVDS connector (1)	20-pin crimp	LVDS1
LVDS connector (2)	30-pin crimp	LVDS2
LVDS1 backlight connector	5-pin wafer	INV1
LVDS2 backlight connector	5-pin wafer	INV2
microSD card slot	microSD slot	CN7
PCI slot	PCI slot	PCI1
PCIe Mini card slot	PCIe Mini card slot	M_PCIE1
Power connector (9 V – 28 V)	4-pin connector	CN3
Power button	Push button	PWR_SW1
RS-232 serial ports (COM3, COM5, COM6)	10-pin header	COM3, COM5, COM6
RS-422/485 serial port (COM4)	4-pin wafer	COM4
SATA connectors	SATA connector	SATA1, SATA2
SATA power connectors	4-pin wafer	SATA_PWR1 SATA_PWR2
SO-DIMM connector	SO-DIMM connector	DIMM1



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Connector	Type	Label
SPDIF connector	5-pin header	SPDIF1
SPI Flash	6-pin wafer	JSP11
USB 2.0 connectors	8-pin header	USB2, USB3

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

The table below lists the rear panel connectors on the KINO-CV-D25501/N26001. Detailed descriptions of these connectors can be found in a later section.

Connector	Type	Label
Audio jacks	Audio jack	AUDIO_CV1
Ethernet and USB 2.0 ports	RJ-45, USB	LAN1_USB1
Ethernet and USB 3.0 ports	RJ-45, USB	LAN2_USB2
HDMI connector	HDMI	HDMI1
Power jack	4-pin DIN	PWR1
Serial port connectors (COM1, COM2)	Male D-sub 9	COM1
VGA connector	Female D-sub 15	CRT1

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-CV-D25501/N26001.

3.2.1 Battery Connector



CAUTION:

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

Dispose of used batteries according to instructions and local regulations.

CN Label:	CN1
CN Type:	2-pin wafer
CN Location:	See Figure 3-2
CN Pinouts:	See Table 3-3

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

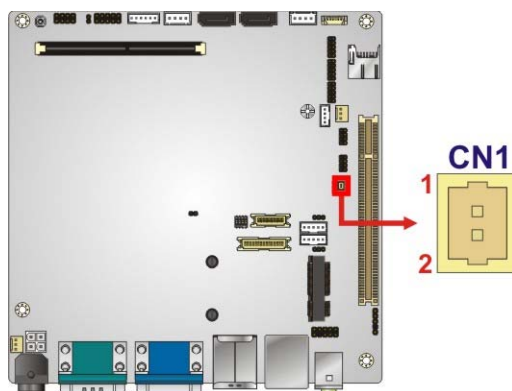


Figure 3-2: Battery Connector Location

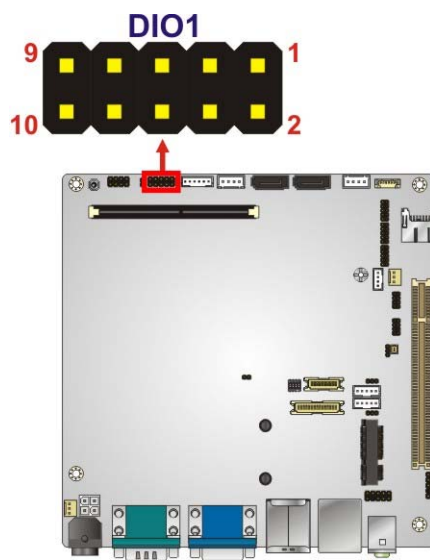
Pin	Description
1	Battery+
2	Ground

Table 3-3: Battery Connector Pinouts

KINO-CV-D25501/N26001 SBC**3.2.2 Digital I/O Connector**

CN Label:	DIO1
CN Type:	10-pin header
CN Location:	See Figure 3-3
CN Pinouts:	See Table 3-4

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

Pin	Description	Pin	Description
1	GND	2	VCC
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 3-4: Digital I/O Connector Pinouts

3.2.3 Fan Connectors

CN Label: CPU_FAN1, SYS_FAN1

CN Type: 3-pin wafer

CN Location: See **Figure 3-4**

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

The fan connector attaches to a cooling fan.

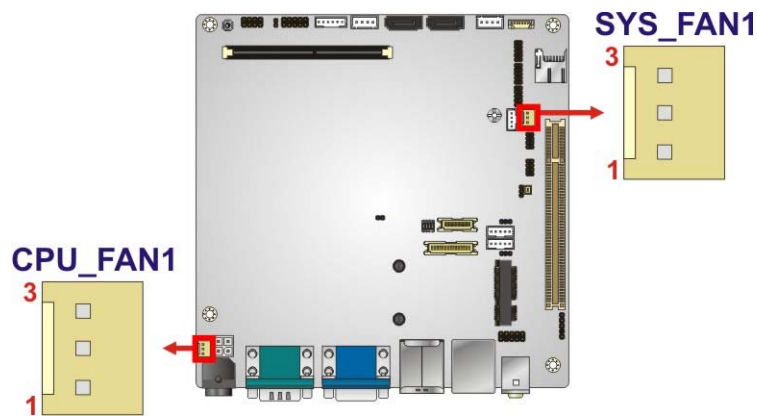


Figure 3-4: Fan Connector Locations

Pin	Description
1	FANIO1
2	+12V (PWM)
3	GND

Table 3-5: Fan Connector Pinouts

3.2.4 Front Audio Connector

CN Label: FRONT-PANEL1

CN Type: 10-pin header

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

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

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This connector connects to speaker, microphone and audio input connectors on the front panel.

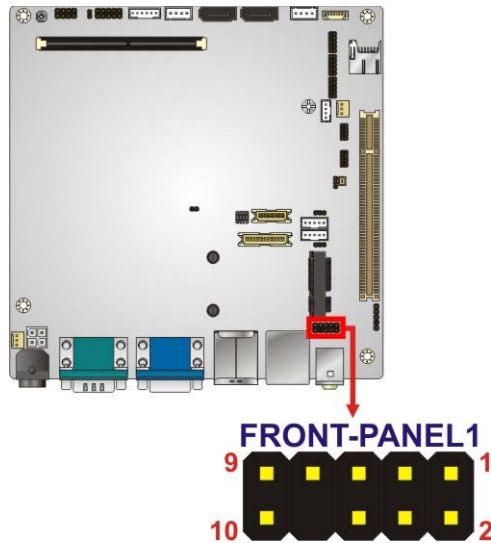


Figure 3-5: Front Audio Connector Location

Pin	Description	Pin	Description
1	MIC_L	2	GND
3	MIC_R	4	Audio Detect
5	LINE2-R	6	GND
7	Jack Detection	8	N/C
9	LINE2-L	10	GND

Table 3-6: Front Audio Connector Pinouts

3.2.5 Front Panel Connector

CN Label: F_PANEL1
CN Type: 8-pin header
CN Location: See **Figure 3-6**
CN Pinouts: See **Table 3-7**

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

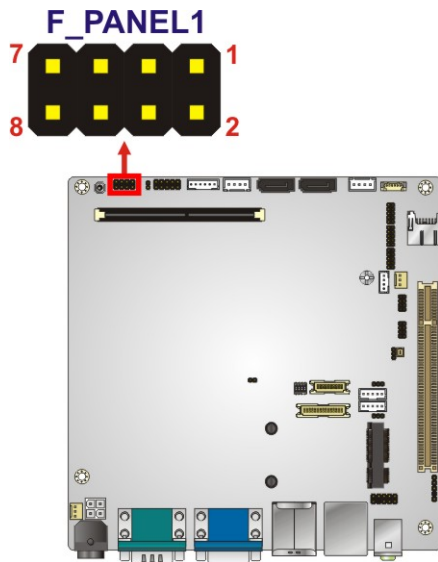


Figure 3-6: Front Panel Connector Location

	Pin	Description		Pin	Description
Power Button	1	PWRBTSW-	Power LED	2	VCC
	3	GROUND		4	GROUND
HDD LED	5	VCC	Reset	6	SYSRST-
	7	-HDLED		8	Ground

Table 3-7: Front Panel Connector Pinouts

3.2.6 Keyboard/Mouse Connector

- CN Label:

KB_MS1
- CN Type:

6-pin wafer
- CN Location:

See Figure 3-7
- CN Pinouts:

See Table 3-8

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

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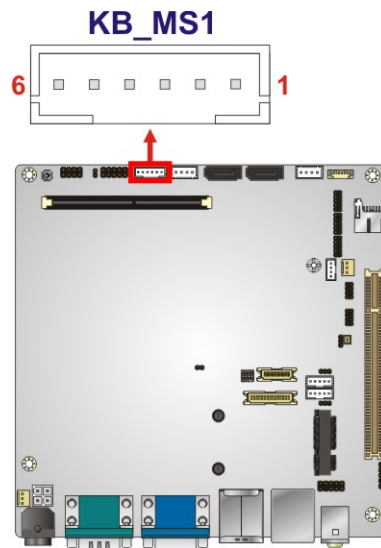


Figure 3-7: Keyboard/Mouse Connector Location

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

Table 3-8: Keyboard/Mouse Connector Pinouts

3.2.7 LVDS Connector (LVDS1)

CN Label:	LVDS1
CN Type:	20-pin crimp
CN Location:	See Figure 3-8
CN Pinouts:	See Table 3-9

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

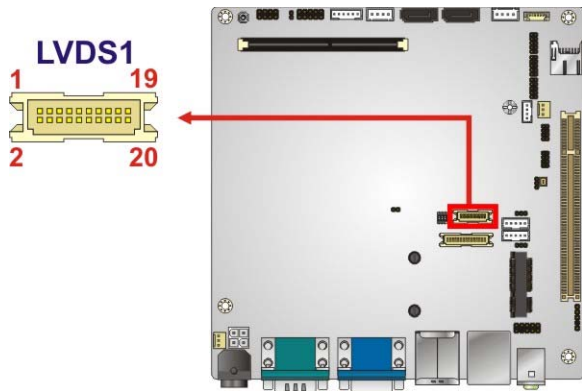


Figure 3-8: LVDS1 Connector Location

Pin	Description	Pin	Description
1	GND	2	GND
3	LVDS_DATA0	4	LVDS_DATA0#
5	LVDS_DATA1	6	LVDS_DATA1#
7	LVDS_DATA2	8	LVDS_DATA2#
9	LVDS_CLK	10	LVDS_CLK#
11	NC	12	NC
13	GND	14	GND
15	LDDC_DATA	16	LDDC_CLK
17	VCC_LCD	18	VCC_LCD
19	VCC_LCD	20	VCC_LCD

Table 3-9: LVDS1 Connector Pinouts

3.2.8 LVDS Connector (LVDS2)

- CN Label:

LVDS2
- CN Type:

30-pin crimp
- CN Location:

See Figure 3-9
- CN Pinouts:

See Table 3-10

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

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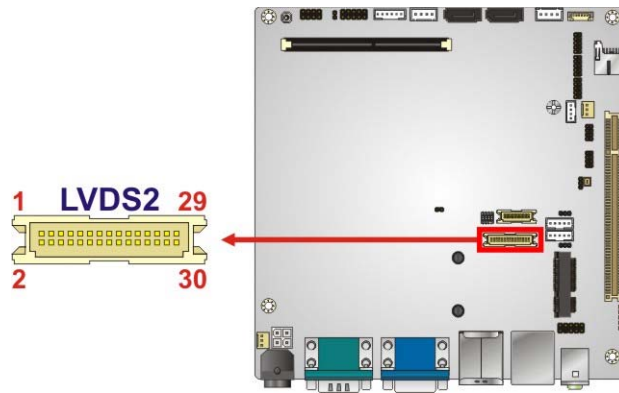


Figure 3-9: LVDS2 Connector Location

Pin	Description	Pin	Description
1	GND	2	GND
3	LVDS_DATA0	4	LVDS_DATA0#
5	LVDS_DATA1	6	LVDS_DATA1#
7	LVDS_DATA2	8	LVDS_DATA2#
9	LVDS_CLK1	10	LVDS_CLK1#
11	LVDS_DATA3	12	LVDS_DATA3#
13	GND	14	GND
15	LVDS_DATA4	16	LVDS_DATA4#
17	LVDS_DATA5	18	LVDS_DATA5#
19	LVDS_DATA6	20	LVDS_DATA6#
21	LVDS_CLK2	22	LVDS_CLK2#
23	LVDS_DATA7	24	LVDS_DATA7#
25	GND	26	GND
27	VCC_LCD	28	VCC_LCD
29	VCC_LCD	30	VCC_LCD

Table 3-10: LVDS2 Connector Pinouts

3.2.9 LVDS Backlight Connectors

- CN Label:

INV1, INV2
- CN Type:

5-pin wafer
- CN Location:

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

See **Table 3-11**

The backlight inverter connectors provide power to LCD panels.

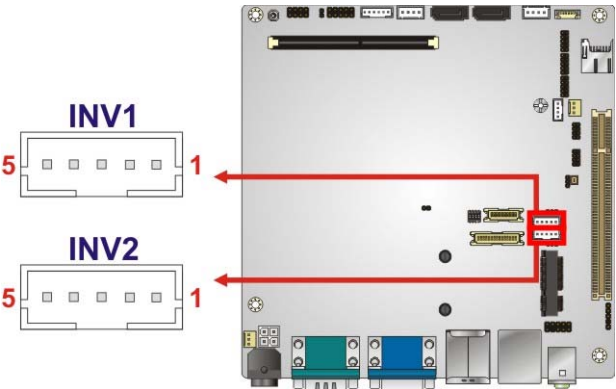


Figure 3-10: LVDS Backlight Inverter Connectors

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

Table 3-11: Backlight Inverter Connector Pinouts

3.2.10 microSD Card Slot

- CN Label:

CN7
- CN Type:

8-pin microSD slot
- CN Location:

See **Figure 3-11**

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

A microSD card can be installed in the microSD card slot.

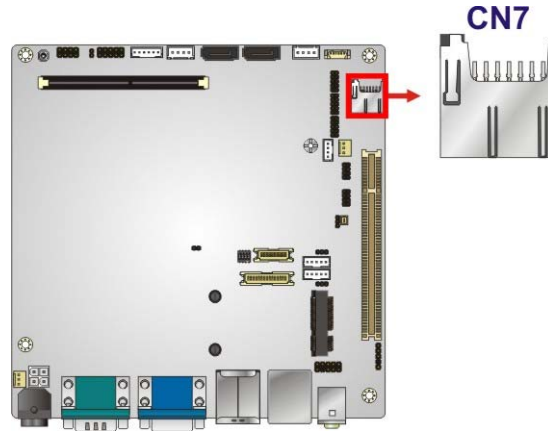


Figure 3-11: microSD Slot Location

Pin	Description
1	DAT2
2	DAT3
3	CMD
4	VDD
5	CLK
6	VSS1
7	DAT0
8	DAT1

Table 3-12: microSD Slot Connector Pinouts

3.2.11 PCIe Mini Card Slot

CN Label: M_PCIE1

CN Type: PCIe Mini card slot

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

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

The PCIe mini card slot enables a PCIe mini card expansion module to be connected to the board. Cards supported include among others wireless LAN (WLAN) cards and mSATA cards.



NOTE:

If the PCIe Mini slot is installed with an mSATA card, the **SATA2** connector will be disabled.

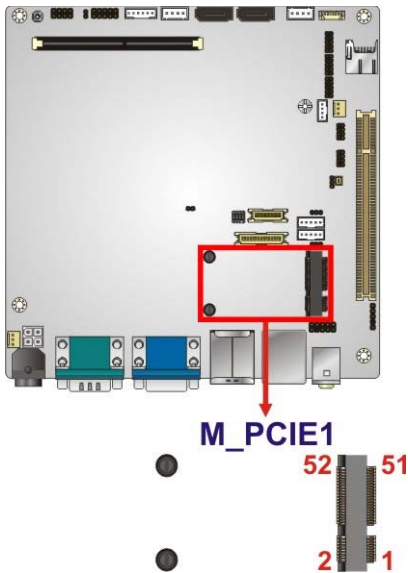


Figure 3-12: PCIe Mini Card Slot Location

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	PCIE_CLK#	12	N/C
13	PCIE_CLK	14	N/C
15	GND	16	N/C

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Pin	Description	Pin	Description
17	N/C	18	GND
19	N/C	20	N/C
21	GND	22	PCIRST#
23	PCIE_RXN	24	VCC3
25	PCIE_RXP	26	GND
27	GND	28	1.5V
29	GND	30	SMBCLK
31	PCIE_TXN	32	SMBDATA
33	PCIE_TXP	34	GND
35	GND	36	USBD-
37	GND	38	USBD+
39	VCC3	40	GND
41	VCC3	42	N/C
43	GND	44	N/C
45	N/C	46	N/C
47	N/C	48	1.5V
49	N/C	50	GND
51	M-SATA Detect	52	VCC3

Table 3-13: PCIe Mini Card Slot Pinouts**3.2.12 Power Connector (9 V – 28 V)**

CN Label:	CN3
CN Type:	4-pin connector
CN Location:	See Figure 3-13
CN Pinouts:	See Table 3-14

The power connector is connected to an external power supply and supports 9 V – 28 V power input. Power is provided to the system, from the power supply through this connector.

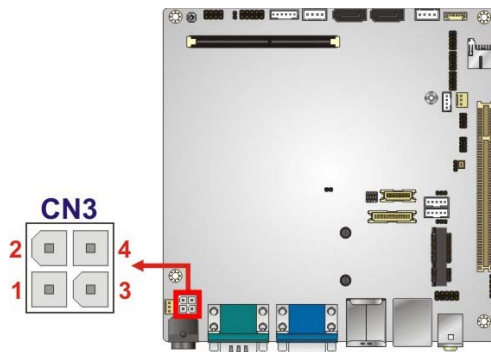


Figure 3-13: ATX Power Connector Location

Pin	Description	Pin	Description
1	Ground	2	Ground
3	Power	4	Power

Table 3-14: Power Connector Pinouts

3.2.13 Power Button

CN Label: PWR_SW1

CN Type: Push button

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

It is an on-board power button. Push the power button to turn on the system.

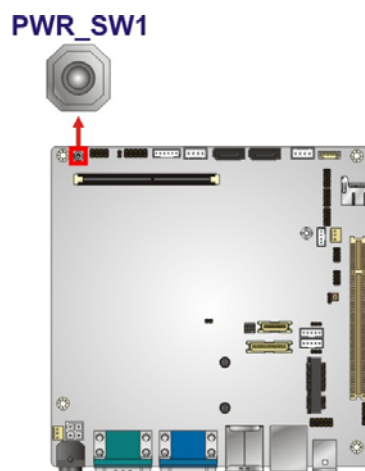


Figure 3-14: Power Button Location

KINO-CV-D25501/N26001 SBC**3.2.14 RS-232 Serial Port Connectors (COM3, COM5, COM6)**

CN Label: COM3, COM5, COM6

CN Type: 10-pin header

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

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

The 10-pin serial port connectors provide three RS-232 serial communications channels. The COM serial port connectors can be connected to external RS-232 serial port devices.

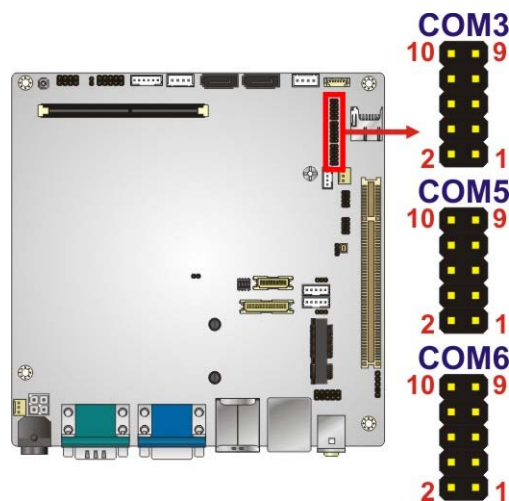


Figure 3-15: RS-232 Serial Port Connector Location

Pin	Description	Pin	Description
1	DATA CARRIER DETECT (DCD)	2	DATA SET READY (DSR)
3	RECEIVE DATA (RXD)	4	REQUEST TO SEND (RTS)
5	TRANSMIT DATA (TXD)	6	CLEAR TO SEND (CTS)
7	DATA TERMINAL READY (DTR)	8	RING INDICATOR (RI)
9	GND	10	GND

Table 3-15: Serial Port Connector Pinouts

3.2.15 RS-422/485 Serial Port Connector (COM4)

- CN Label:

COM4
- CN Type:

4-pin wafer
- CN Location:

See Figure 3-16
- CN Pinouts:

See Table 3-16

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

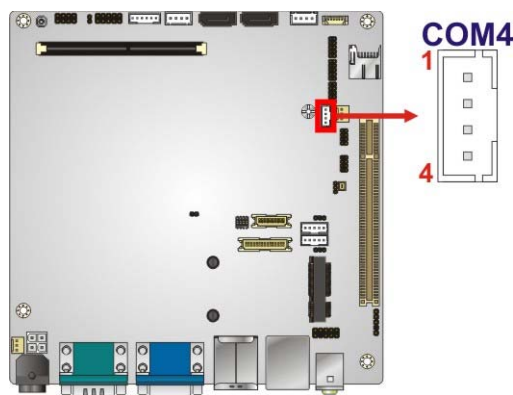


Figure 3-16: RS-422/485 Serial Port Connector Location

Pin	Description
1	RXD485#
2	RXD485+
3	TXD485+
4	TXD485#

Table 3-16: 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.

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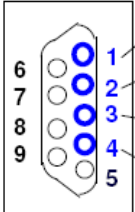
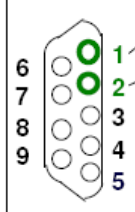
RS-422 Pinouts	RS-485 Pinouts
 <p> 1 TX- (TXD485#) 2 TX+ (TXD485+) 3 RX+ (RXD485+) 4 RX- (RXD485#) </p>	 <p> 1 TX- (TXD485#) 2 TX+ (TXD485+) </p>

Table 3-17: D-sub 9 RS-422/485 Pinouts

3.2.16 SATA Drive Connectors

CN Label:	SATA1, SATA2
CN Type:	7-pin SATA drive connectors
CN Location:	See Figure 3-17
CN Pinouts:	See Table 3-18

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



NOTE:

If the PCIe Mini slot is installed with an mSATA card, the **SATA2** connector will be disabled.

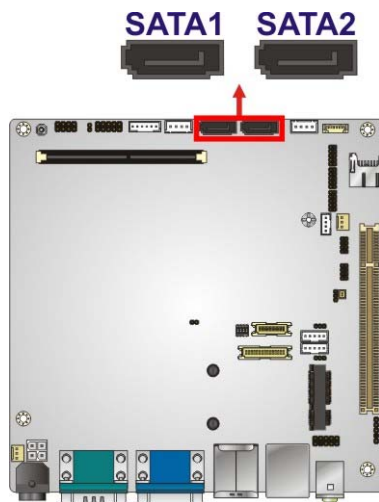


Figure 3-17: SATA Drive Connector Location

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

Table 3-18: SATA Drive Connector Pinouts

3.2.17 SATA Power Connectors

- CN Label:

SATA_PWR1, SATA_PWR2
- CN Type:

4-pin wafer
- CN Location:

See Figure 3-18
- CN Pinouts:

See Table 3-19

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

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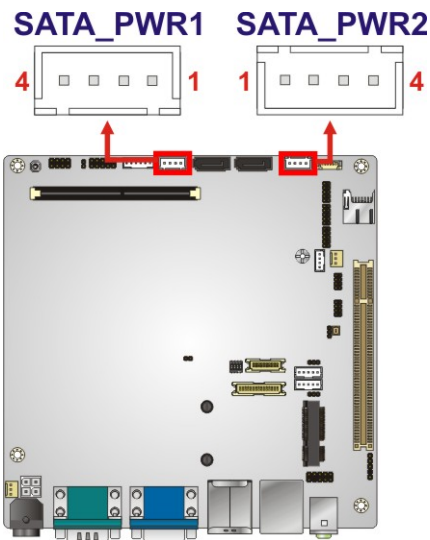


Figure 3-18: SATA Power Connector Locations

Pin	Description
1	12V
2	GND
3	GND
4	5V

Table 3-19: SATA Power Connector Pinouts

3.2.18 SO-DIMM Connector

CN Label: DIMM1
CN Type: 204-pin DDR3 SO-DIMM connector
CN Location: See Figure 3-19

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

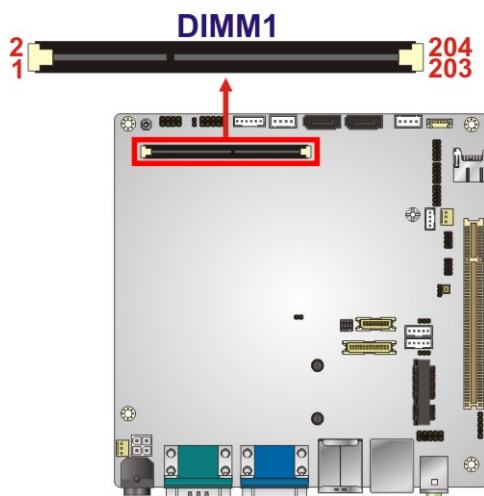


Figure 3-19: SO-DIMM Connector Location

3.2.19 SPDIF Connector

CN Label:	SPDIF1
CN Type:	5-pin header
CN Location:	See Figure 3-20
CN Pinouts:	See Table 3-20

Use the SPDIF connector to connect digital audio devices to the system.

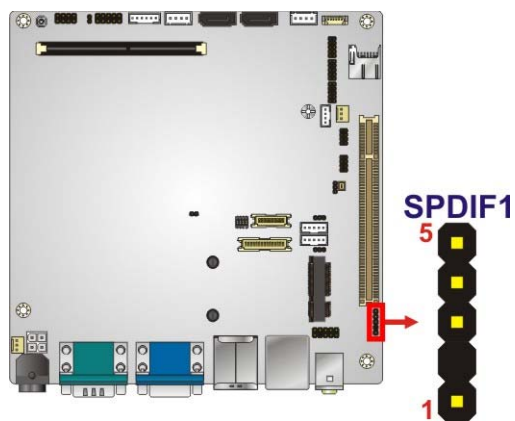


Figure 3-20: SPDIF Connector Location

KINO-CV-D25501/N26001 SBC

Pin	Description
1	VCC AUDIO
2	NC
3	SPDIF OUT
4	GND
5	SPDIF IN

Table 3-20: SPDIF Connector Pinouts

3.2.20 SPI Flash Connector

CN Label:	JSPI1
CN Type:	6-pin header
CN Location:	See Figure 3-21
CN Pinouts:	See Table 3-21

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

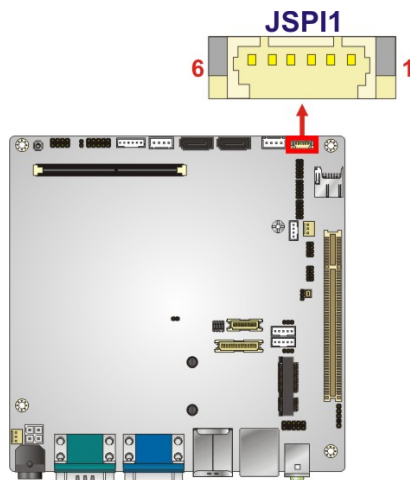


Figure 3-21: SPI Flash Connector Location

Pin	Description	Pin	Description
1	SPI_VCC	2	SPI_CS
3	SPI_SO	4	SPI_CLK
5	SPI_SI	6	GND

Table 3-21: SPI Flash Connector Pinouts

3.2.21 USB 2.0 Connectors

- CN Label:USB2, USB3
- CN Type:8-pin header
- CN Location:See Figure 3-22
- CN Pinouts:See Table 3-22

The USB header can connect to two USB devices.

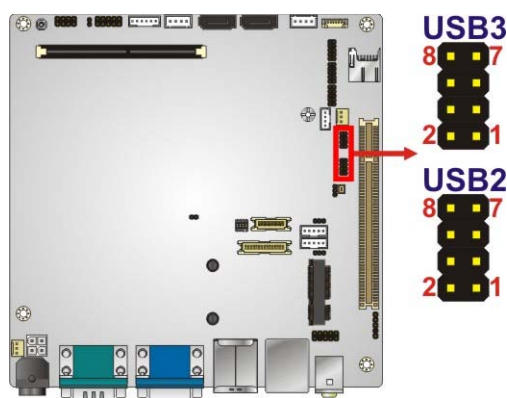


Figure 3-22: USB Connector Locations

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

Table 3-22: USB Port Connector Pinouts

KINO-CV-D25501/N26001 SBC

3.3 External Interface Connectors

Figure 3-23 shows the KINO-CV-D25501/N26001 motherboard external interface connectors. The KINO-CV-D25501/N26001 on-board external interface connectors are shown in **Figure 3-23**.

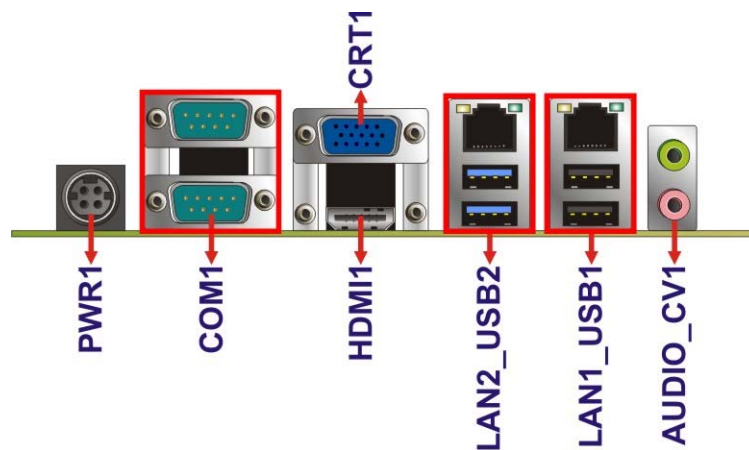


Figure 3-23: External Interface Connectors

3.3.1 Audio Connector

CN Label: AUDIO_CV1
CN Type: Audio jacks
CN Location: See **Figure 3-23**

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 3-24: Audio Connector

3.3.2 Ethernet and USB 2.0 Combo Connector

- CN Label:** LAN1_USB1
- CN Type:** RJ-45 and USB 2.0 connector
- CN Location:** See **Figure 3-23**
- CN Pinouts:** See **Table 3-23** and **Table 3-25**

The LAN connector connects to a local network.

PIN	DESCRIPTION	PIN	DESCRIPTION
1	LAN1_MDI0P	5	LAN1_MDI2P
2	LAN1_MDI0N	6	LAN1_MDI2N
3	LAN1_MDI1P	7	LAN1_MDI3P
4	LAN1_MDI1N	8	LAN1_MDI3N

Table 3-23: LAN1 Pinouts

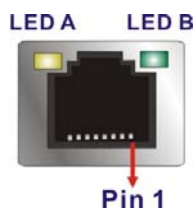


Figure 3-25: Ethernet Connector

KINO-CV-D25501/N26001 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 3-24: Connector LEDs

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

PIN	DESCRIPTION
1	5 V
2	Data-
3	Data+
4	GND

Table 3-25: USB Port Pinouts**3.3.3 Ethernet and USB 3.0 Combo Connector**

CN Label: LAN2_USB2

CN Type: RJ-45 and USB 3.0 connector

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

CN Pinouts: See **Table 3-26** and **Table 3-28**

The LAN connector connects to a local network.

PIN	DESCRIPTION	PIN	DESCRIPTION
1	LAN2_MDI0P	5	LAN2_MDI2P
2	LAN2_MDI0N	6	LAN2_MDI2N
3	LAN2_MDI1P	7	LAN2_MDI3P
4	LAN2_MDI1N	8	LAN2_MDI3N

Table 3-26: LAN2 Pinouts

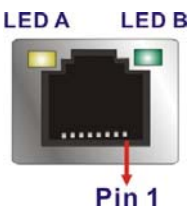


Figure 3-26: Ethernet Connector

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 3-27: Connector LEDs

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

Pin	Description	Pin	Description
1	VCC	10	VCC
2	USB_DATA-	11	USB_DATA-
3	USB_DATA+	12	USB_DATA+
4	GND	13	GND
5	USB3_RX-	14	USB3_RX-
6	USB3_RX+	15	USB3_RX+
7	GND	16	GND
8	USB3_TX-	17	USB3_TX-
9	USB3_TX+	18	USB3_TX+

Table 3-28: USB 3.0 Port Pinouts

3.3.4 HDMI Connector

- CN Label:

HDMI1
- CN Type:

HDMI connector
- CN Location:

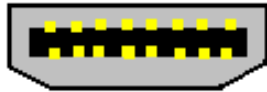
See Figure 3-23
- CN Pinouts:

See Table 3-29 and Figure 3-27

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

KINO-CV-D25501/N26001 SBC

Pin	Description	Pin	Description
1	HDMI_DATA2	13	N/C
2	GND	14	N/C
3	HDMI_DATA2#	15	HDMI_SCL
4	HDMI_DATA1	16	HDMI_SDA
5	GND	17	GND
6	HDMI_DATA1#	18	+5V
7	HDMI_DATA0	19	HDMI_HPD
8	GND	20	HDMI_GND
9	HDMI_DATA0#	21	HDMI_GND
10	HDMI_CLK	22	HDMI_GND
11	GND	23	HDMI_GND
12	HDMI_CLK#		

Table 3-29: HDMI Connector Pinouts**Figure 3-27: HDMI Connector****3.3.5 Power Connector (9 V – 28 V, Power Adapter)**

CN Label: PWR1

CN Type: 4-pin DIN

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

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

The connector supports the 9 V – 28 V power adapter.

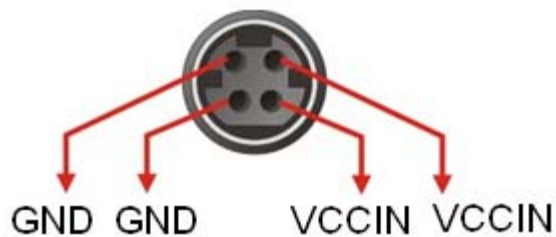


Figure 3-28: 4-pin Power DIN Connection

3.3.6 Serial Port Connectors (COM1, COM2)

- CN Label:** COM1
- CN Type:** D-sub 9 Male connector
- CN Location:** See **Figure 3-23**
- CN Pinouts:** See **Table 3-30** and **Figure 3-29**

The RS-232 serial connector provides serial connection in the RS-232 mode.

Pin	Description	Pin	Description
1	DCD	6	DSR
2	RXD	7	RTS
3	TXD	8	CTS
4	DTR	9	RI
5	GND		

Table 3-30: Serial Port Pinouts

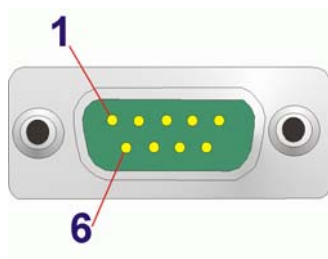


Figure 3-29: Serial Port Pinout Locations

KINO-CV-D25501/N26001 SBC

3.3.7 VGA Connector

**NOTE:**

Due to Intel® GMA driver limitation, the monitor connected to the VGA connector may not have signal to it after restarting from the graphics driver installation. To solve this problem, press the **Ctrl+Alt+F1** hotkey to switch the screen to CRT mode.

CN Label: CRT1

CN Type: D-sub 15-pin female connector

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

CN Pinouts: See **Figure 3-30** and **Table 3-31**

The standard 15-pin female VGA connector connects to a CRT or LCD monitor.

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

Table 3-31: VGA Connector Pinouts

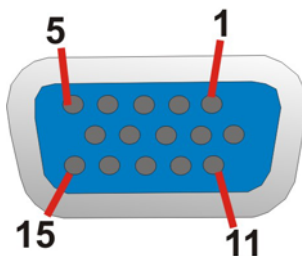


Figure 3-30: VGA Connector

Chapter

4

Installation

4.1 Anti-static Precautions



WARNING:

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

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the KINO-CV-D25501/N26001. Dry climates are especially susceptible to ESD. It is therefore critical to strictly adhere to the following anti-static precautions whenever the KINO-CV-D25501/N26001, 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-CV-D25501/N26001, place it on an anti-static pad. This reduces the possibility of ESD damaging the KINO-CV-D25501/N26001.
- ***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-CV-D25501/N26001 is installed. All installation notices pertaining to the installation of KINO-CV-D25501/N26001 should be strictly adhered to. Failing to adhere to these precautions may lead to severe damage of the KINO-CV-D25501/N26001 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-CV-D25501/N26001, KINO-CV-D25501/N26001 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.

KINO-CV-D25501/N26001 SBC

Before and during the installation of the KINO-CV-D25501/N26001 **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.

4.3 SO-DIMM Installation

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

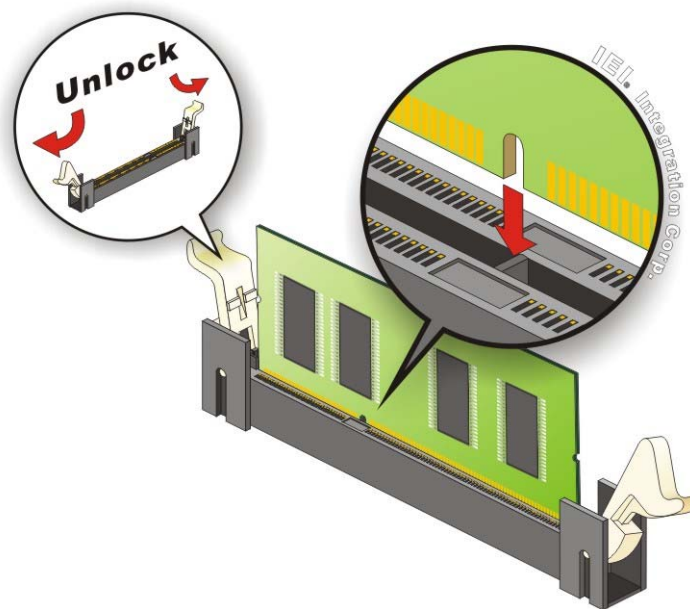


Figure 4-1: SO-DIMM Installation

- Step 1:** **Open the SO-DIMM socket handles.** Open the two handles outwards as far as they can. See **Figure 4-1**.
- 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 4-1**.
- 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 4-1**.

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.

4.4 PCIe Mini Card Installation

To install the PCIe Mini card, please refer to the diagram and instructions below.

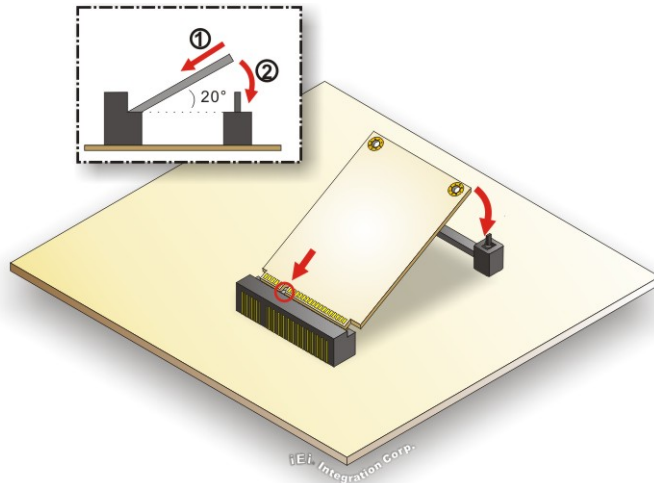


Figure 4-2: PCIe Mini Card Installation

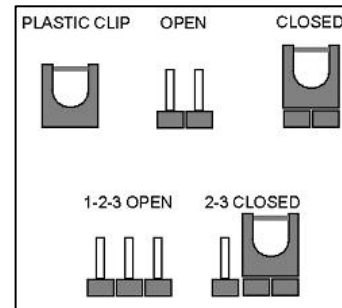
- Step 1: Insert into the socket at an angle.** Line up the notch on the card with the notch on the connector. Slide the PCIe Mini card into the socket at an angle of about 20°.
- Step 2: Push down until the card clips into place.** Push the other end of the card down until it clips into place on the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

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4.5 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-CV-D25501/N26001 is installed in the system, the jumpers must be set in accordance with the desired configuration. The jumpers on the KINO-CV-D25501/N26001 are listed in Table 4-1.

Description	Label	Type
AT/ATX mode selection	JP2	2-pin header
Clear CMOS	JP3	3-pin header
LVDS1 voltage selection	JP4	3-pin header
LVDS2 voltage selection	JP1	3-pin header
LVDS2 resolution selection	SW1	DIP switch
PCIe Mini/mSATA mode selection	MSATA_SW1	2-pin header

Table 4-1: Jumpers

4.5.1 AT/ATX Mode Selection

Jumper Label: JP2
Jumper Type: 2-pin header
Jumper Settings: See Table 4-2

Jumper Location: See **Figure 4-3**

Set both of the jumpers select AT or ATX power mode for the KINO-CV-D25501/N26001. 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. The settings on both jumpers should be the same.

Pin	Description
Closed	ATX mode (Default)
Open	AT mode

Table 4-2: AT/ATX Mode Selection

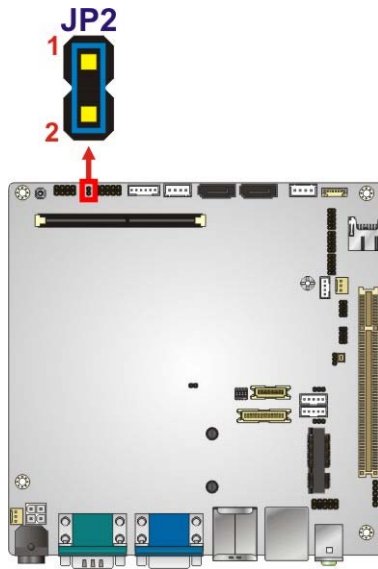


Figure 4-3: AT/ATX Mode Selection Jumper Location

4.5.2 Clear CMOS Jumper

Jumper Label: JP3
Jumper Type: 3-pin header
Jumper Settings: See **Table 4-3**
Jumper Location: See **Figure 4-4**

If the KINO-CV-D25501/N26001 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,

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use the jumper cap to close pins 2 and 3 for a few seconds then reinstall the jumper clip back to pins 1 and 2.

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
- Load Failsafe Defaults.

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

The clear CMOS jumper settings are shown in Table 4-3.

Pin	Description
Short 1-2	Keep CMOS Setup (Default)
Short 2-3	Clear CMOS Setup

Table 4-3: Clear CMOS Jumper Settings

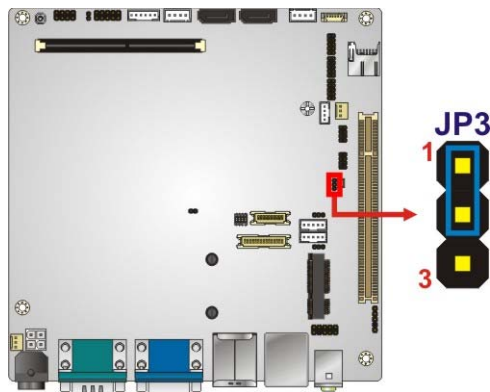


Figure 4-4: Clear CMOS Jumper Location

4.5.3 LVDS1 Voltage Selection

Jumper Label: JP4
Jumper Type: 3-pin header
Jumper Settings: See Table 4-4

Jumper Location: See Figure 4-5

The JP4 jumper selects the voltage of the LVDS1 connector.

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

Table 4-4: LVDS1 Voltage Selection

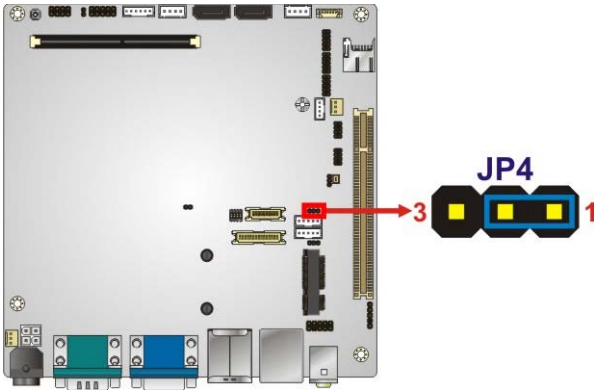


Figure 4-5: LVDS1 Voltage Selection Jumper Location

4.5.4 LVDS2 Voltage Selection

Jumper Label: JP1

Jumper Type: 3-pin header

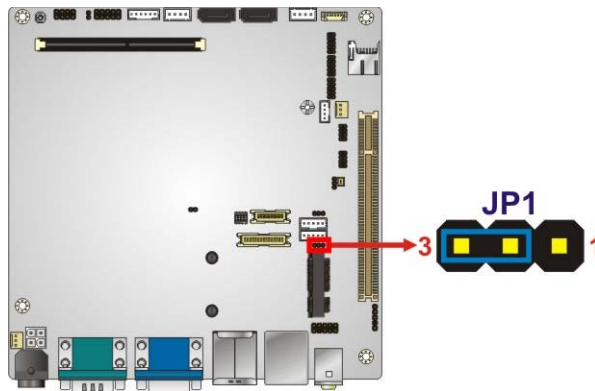
Jumper Settings: See Table 4-4

Jumper Location: See Figure 4-5

The JP1 jumper selects the voltage of the LVDS2 connector.

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

Table 4-5: LVDS2 Voltage Selection

KINO-CV-D25501/N26001 SBC**Figure 4-6: LVDS2 Voltage Selection Jumper Location****4.5.5 LVDS2 Resolution Selection**

Jumper Label:	SW1
Jumper Type:	DIP switch
Jumper Settings:	See Table 4-6
Jumper Location:	See Figure 4-7

The SW1 switch selects the resolution of the LCD panel connected to the LVDS2 connector.

The pin order listed in the first column of **Table 4-6** is: 4 → 3 → 2 → 1. (ON=0, OFF=1)

SW1	EDID Resolution	Color Depth	Channel
0000	800 x 600 @ 60Hz	18-bit	Single
0001	1024 x 768 @ 60Hz	18-bit	Single
0010	1024 x 768 @ 60Hz	24-bit	Single
0011	1280 x 768 @ 60Hz	18-bit	Single
0100	1280 x 800 @ 60Hz	18-bit	Single
0101	1280 x 960 @ 60Hz	18-bit	Single
0110	1280 x 1024 @ 60Hz	24-bit	Dual
0111	1366 x 678 @ 60Hz	18-bit	Single
1000	1366 x 678 @ 60Hz	24-bit	Single
1001	1440 x 900 @ 60Hz	24-bit	Dual

1010	1440 x 1050 @ 60Hz	24-bit	Dual
1011	1600 x 900 @ 60Hz	24-bit	Dual
1100	1680 x 1050 @ 60Hz	24-bit	Dual
1101	1600 x 1200 @ 60Hz	24-bit	Dual
1110	1920 x 1080 @ 60Hz	24-bit	Dual
1111	1920 x 1200 @ 60Hz	24-bit	Dual

Table 4-6: LVDS2 Resolution Selection

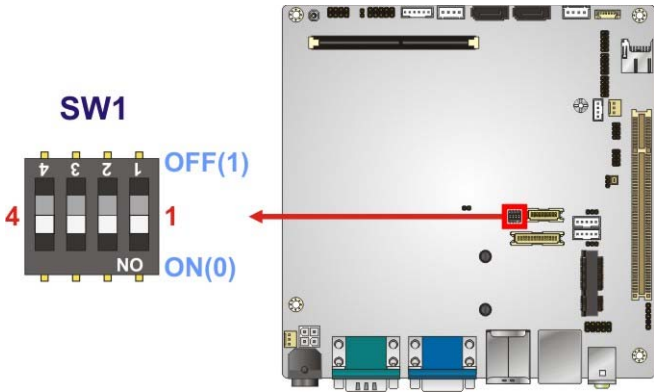


Figure 4-7: LVDS2 Resolution Selection Jumper Location

4.5.6 PCIe Mini/mSATA Mode Selection

- Jumper Label:

MSATA_SW1
- Jumper Type:

2-pin header
- Jumper Settings:

See Table 4-7
- Jumper Location:

See Figure 4-8

The MSATA_SW1 jumper configures the PCIe Mini slot (M_PCIE1) to automatically detect mSATA device or to force mSATA to be enabled.

Pin	Description
Open	Auto-detect mSATA device (Default)
Closed	Enable mSATA

Table 4-7: PCIe Mini/mSATA Mode Selection

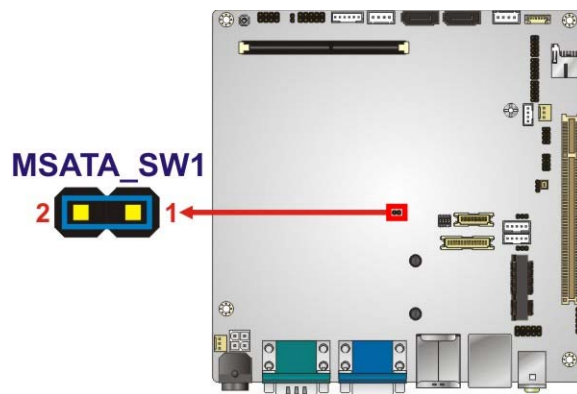
KINO-CV-D25501/N26001 SBC

Figure 4-8: PCIe Mini/mSATA Mode Selection Jumper Location

4.6 Chassis Installation

4.6.1 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-CV-D25501/N26001 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.

4.6.2 Motherboard Installation

To install the KINO-CV-D25501/N26001 motherboard into the chassis please refer to the reference material that came with the chassis.

4.7 Internal Peripheral Device Connections

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

4.7.1 SATA Drive Connection

The KINO-CV-D25501/N26001 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 4-9**.

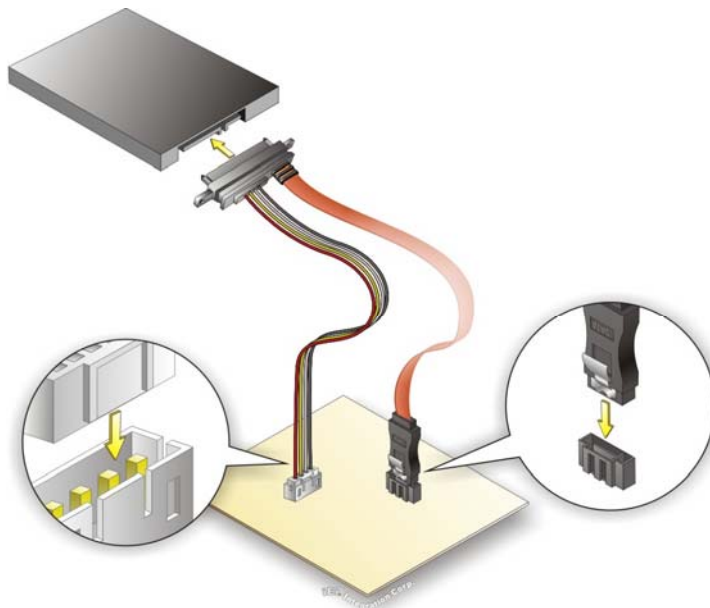


Figure 4-9: SATA Drive Cable Connection

Step 3: Connect the cable to the SATA disk. Connect the connector on the other end of the cable to the connector at the back of the SATA drive. See **Figure 4-9**.

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

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4.7.2 USB Cable Connection

The KINO-CV-D25501/N26001 is shipped with a dual port USB 2.0 cable. To connect the USB cable connector, please follow the steps below.

Step 1: Locate the connectors. The locations of the USB connectors are shown in Chapter 3.



WARNING:

If the USB pins are not properly aligned, the USB device can burn out.

Step 2: Align the connectors. The cable has two connectors. Correctly align the ground wire (black) on each cable connector with the ground pin on the KINO-CV-D25501/N26001 USB connector. See **Table 3-22** for the USB connector pinouts.

Step 3: Insert the cable connectors Once the cable connectors are properly aligned with the USB connectors on the KINO-CV-D25501/N26001, connect the cable connectors to the on-board connectors. See Figure 4-10.

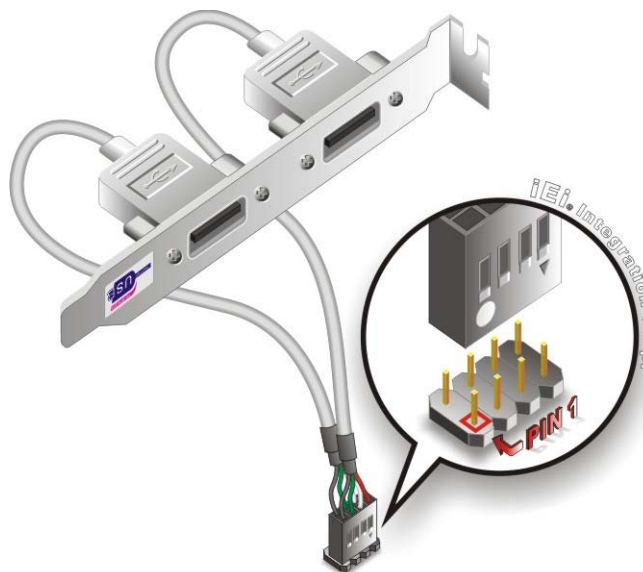


Figure 4-10: Dual USB Cable Connection

Step 4: **Attach the bracket to the chassis.** The USB 2.0 connectors are attached to a bracket. To secure the bracket to the chassis please refer to the installation instructions that came with the chassis.

4.7.3 Keyboard/Mouse Connector (Optional)

The KINO-CV-D25501/N26001 can be shipped with a keyboard/mouse Y-cable connector. The keyboard/mouse Y-cable connector connects to a keyboard/mouse connector on the KINO-CV-D25501/N26001 and branches into two cables that are each connected to a PS/2 connector, one for a mouse and one for a keyboard. To connect the keyboard/mouse Y-cable connector, please follow the steps below.

Step 1: **Locate the connector.** The location of the keyboard/mouse Y-cable connector is shown in **Chapter 3**.

Step 2: **Align the connectors.** Correctly align pin 1 on the cable connector with pin 1 on the KINO-CV-D25501/N26001 keyboard/mouse connector. See Figure 4-11.

Step 3: **Insert the cable connectors** Once the cable connector is properly aligned with the keyboard/mouse connector on the KINO-CV-D25501/N26001, connect the cable connector to the on-board connectors. See Figure 4-11.

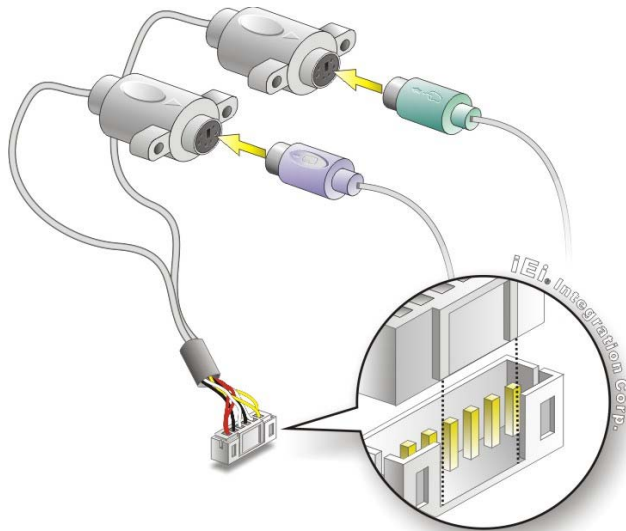


Figure 4-11: Keyboard/mouse Y-cable Connection

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Step 4: Attach PS/2 connectors to the chassis. The keyboard/mouse Y-cable connector is connected to two PS/2 connectors. To secure the PS/2 connectors to the chassis please refer to the installation instructions that came with the chassis.

Step 5: Connect the keyboard and mouse. Once the PS/2 connectors are connected to the chassis, a keyboard and mouse can each be connected to one of the PS/2 connectors. The keyboard PS/2 connector and mouse PS/2 connector are both marked. Please make sure the keyboard and mouse are connected to the correct PS/2 connector.

4.8 Software Installation

All the drivers for the KINO-CV-D25501/N26001 are on the CD that came with the system. To install the drivers, please follow the steps below.

Step 6: Insert the CD into a CD drive connected to the system.

**NOTE:**

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

Step 7: The driver main menu appears (Figure 4-12).



Figure 4-12: Introduction Screen

Step 8: Click KINO-CV-D25501/N26001.

Step 9: A new screen with a list of available drivers appears (Figure 4-13).



Figure 4-13: Available Drivers

Step 10: Install all of the necessary drivers in this menu.

**NOTE:**

Due to Intel® GMA driver limitation, the monitor connected to the VGA connector may not have signal to it after restarting from the graphics driver installation. To solve this problem, press the **Ctrl+Alt+F1** hotkey to switch the screen to CRT mode.

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

If the message disappears before the **DELETE** 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.

Key	Function
Up arrow	Move to the item above
Down arrow	Move to the item below
Left arrow	Move to the item on the left hand side
Right arrow	Move to the item on the right hand side

Key	Function
+	Increase the numeric value or make changes
-	Decrease the numeric value or make changes
Page up	Move to the next page
Page down	Move to the previous page
Esc	Main Menu – Quit and do not save changes into CMOS Status Page Setup Menu and Option Page Setup Menu -- Exit current page and return to Main Menu
F1 key	General help, only for Status Page Setup Menu and Option Page Setup Menu
F2 key	Load previous values
F3 key	Load optimized defaults
F4 key	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 is 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.

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- 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.

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) 2011 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	4.6.5.3 0.16	
Compliancy	UEFI 2.3; PI 1.2	
Project Version	B229AR10.ROM	
Build Date	05/11/2012 17:07:26	-----
System Date	[Tue 05/14/2012]	←→: Select Screen
System Time	[14:20:27]	↑ ↓: Select Item
Access Level	Administrator	EnterSelect
		F1 General Help
		F2 Previous Values
		F3 Optimized Defaults
		F4 Save
		ESC Exit
Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.		

BIOS Menu 1: Main

→ BIOS Information

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 Vendor:** Installed BIOS vendor
- **Core Version:** Current BIOS version
- **Project Version:** the board version
- **Build Date and Time:** Date and time the current BIOS version was made

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.

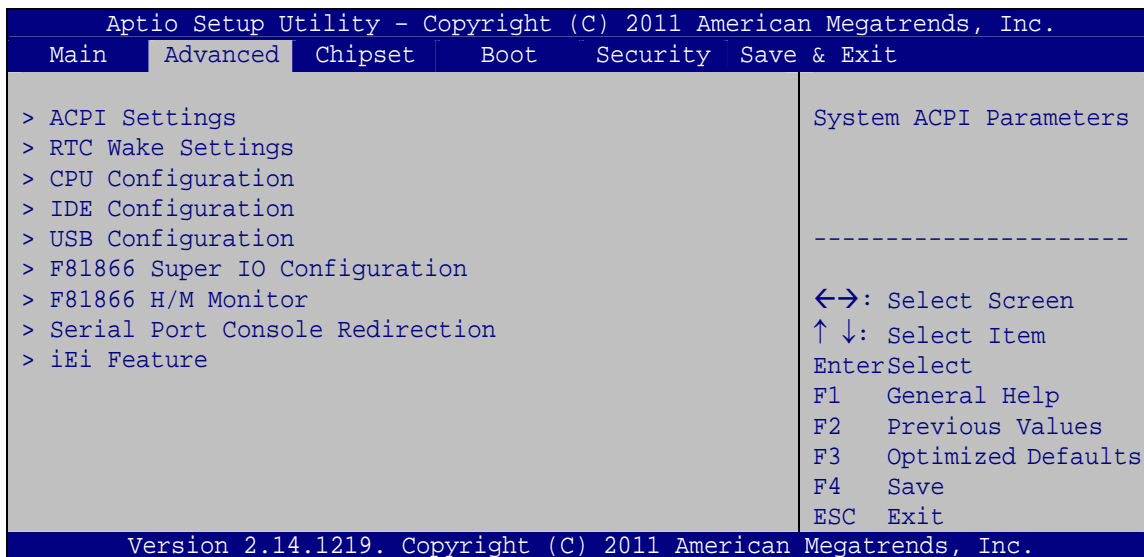
5.3 Advanced

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



WARNING!

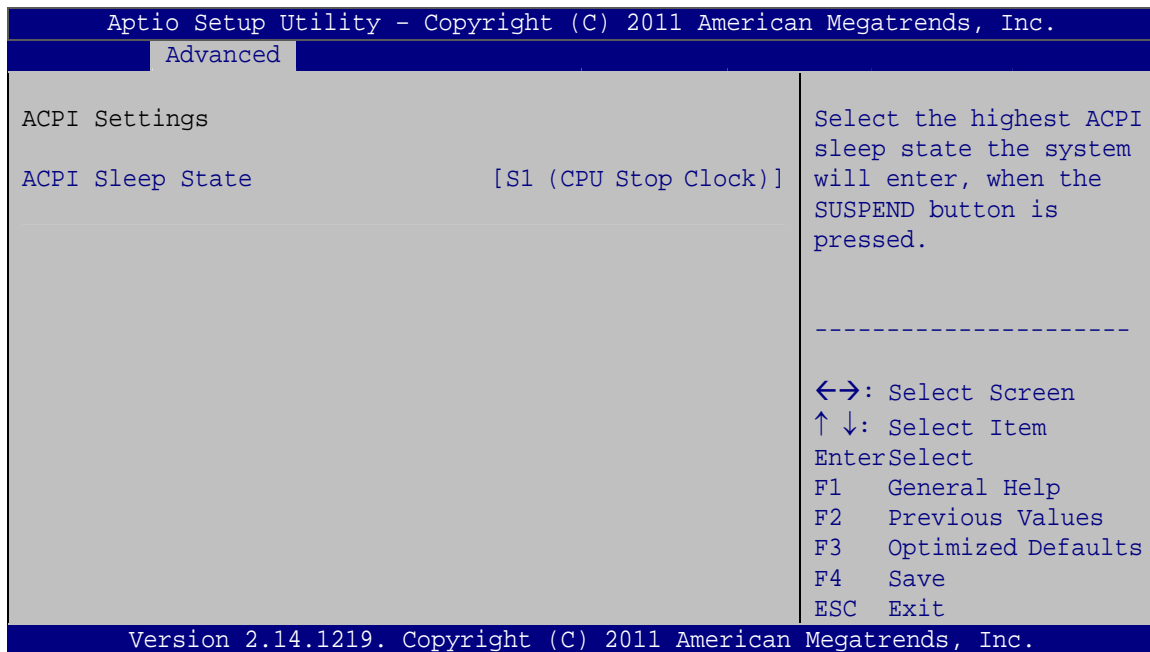
Setting the wrong values in the sections below may cause the system to malfunction. Make sure that the settings made are compatible with the hardware.



BIOS Menu 2: Advanced

5.3.1 ACPI Configuration

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



BIOS Menu 3: ACPI Configuration

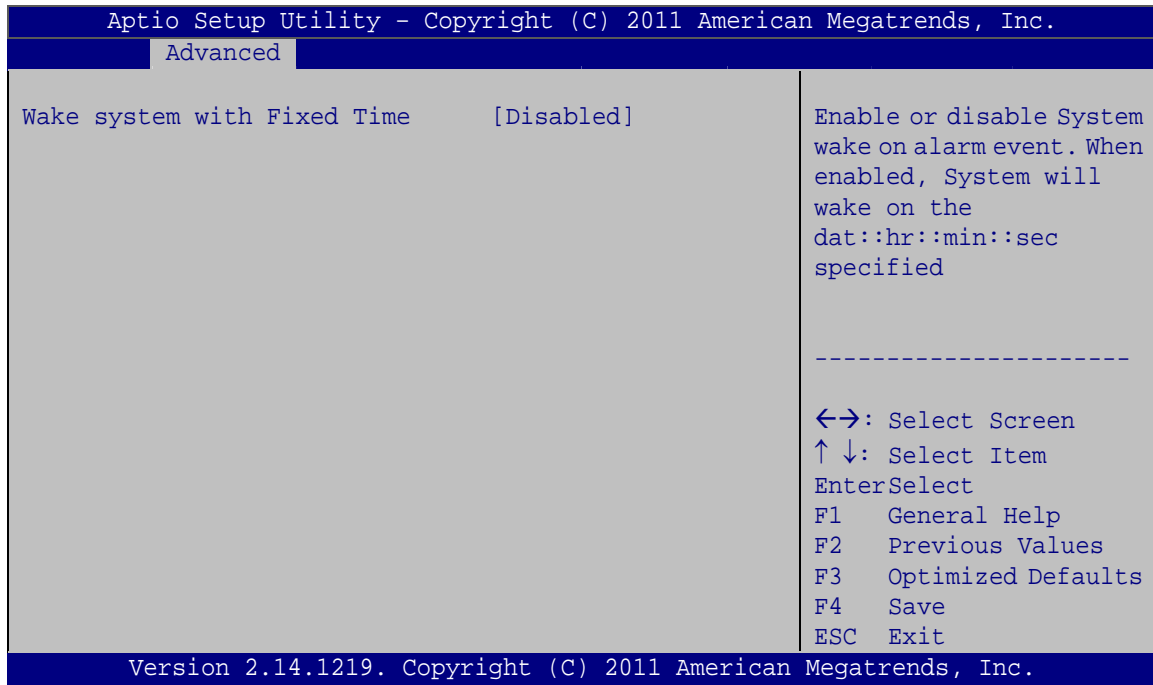
➔ ACPI Sleep State [S1 (CPU Stop Clock)]

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

- ➔ **S1 (CPU Stop DEFAULT Clock)** 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.
- ➔ **S3 (Suspend to RAM)** The caches are flushed and the CPU is powered off. Power to the RAM is maintained. The computer returns slower to a working state, but more power is saved.

5.3.2 RTC Wake Settings

The **RTC Wake Settings** menu (**BIOS Menu 4**) configures RTC wake event.



BIOS Menu 4: RTC Wake Settings

→ Wake System with Fixed Time [Disabled]

Use the **Wake System with Fixed Time** option to specify the time the system should be roused from a suspended state.

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

KINO-CV-D25501/N26001 SBC➔ **Enabled**

If selected, the following appears with values that can be selected:

*Wake up every day

*Wake up date

*Wake up hour

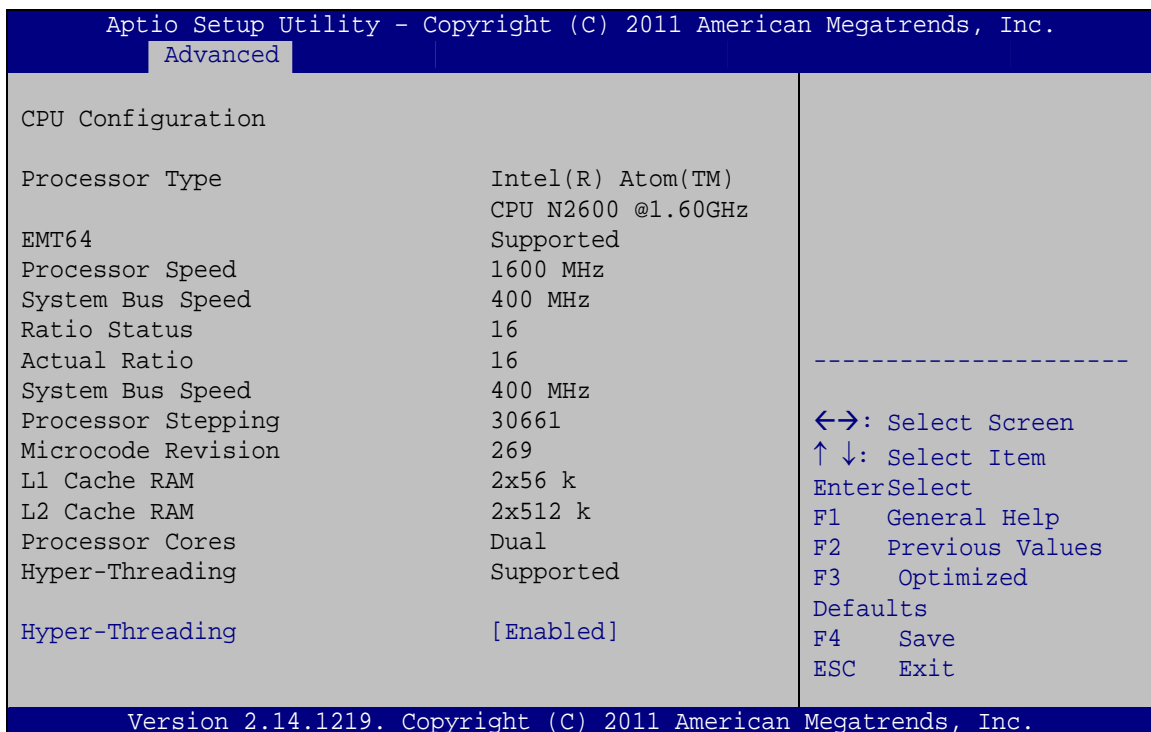
*Wake up minute

*Wake up second

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

5.3.3 CPU Configuration

Use the **CPU Configuration** menu (**BIOS Menu 5**) to view detailed CPU specifications and configure the CPU.

**BIOS Menu 5: CPU Configuration**

The CPU Configuration menu (**BIOS Menu 5**) lists the following CPU details:

- Processor Type: Lists the brand name of the CPU being used
- EMT64: Indicates if the EM64T is supported by the CPU.
- Processor Speed: Lists the CPU processing speed
- Actual Ratio: Lists the ratio of the frequency to the clock speed
- System Bus Speed: Lists the system bus speed
- Processor Stepping: Lists the CPU processing stepping
- Microcode Revision: Lists the microcode revision
- L1 Cache RAM: Lists the CPU L1 cache size
- L2 Cache RAM: Lists the CPU L2 cache size
- Processor Cores: Lists the number of the processor core
- Hyper-Threading: Indicates if the Intel HT Technology is supported by the CPU.

➔ **Hyper Threading Function [Enabled]**

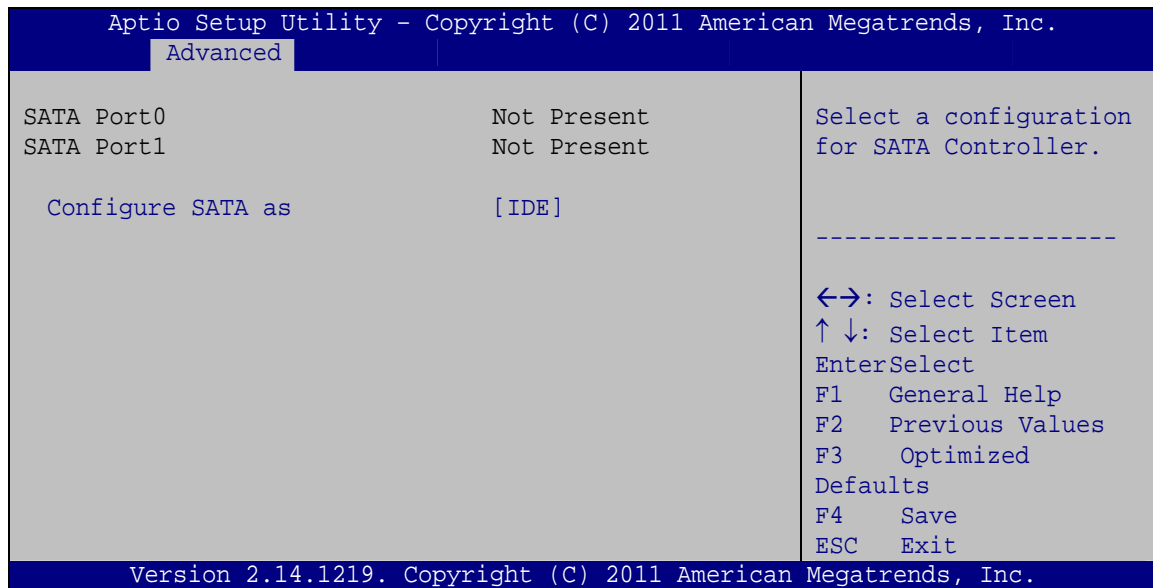
Use the Hyper Threading function to enable or disable the CPU hyper threading function.

- | | | | |
|---|-----------------|----------------|--|
| ➔ | Disabled | | Disables the use of hyper threading technology |
| ➔ | Enabled | DEFAULT | Enables the use of hyper threading technology |

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5.3.4 IDE Configuration

Use the **IDE Configuration** menu (**BIOS Menu 6**) to change and/or set the configuration of the IDE devices installed in the system.



BIOS Menu 6: IDE Configuration

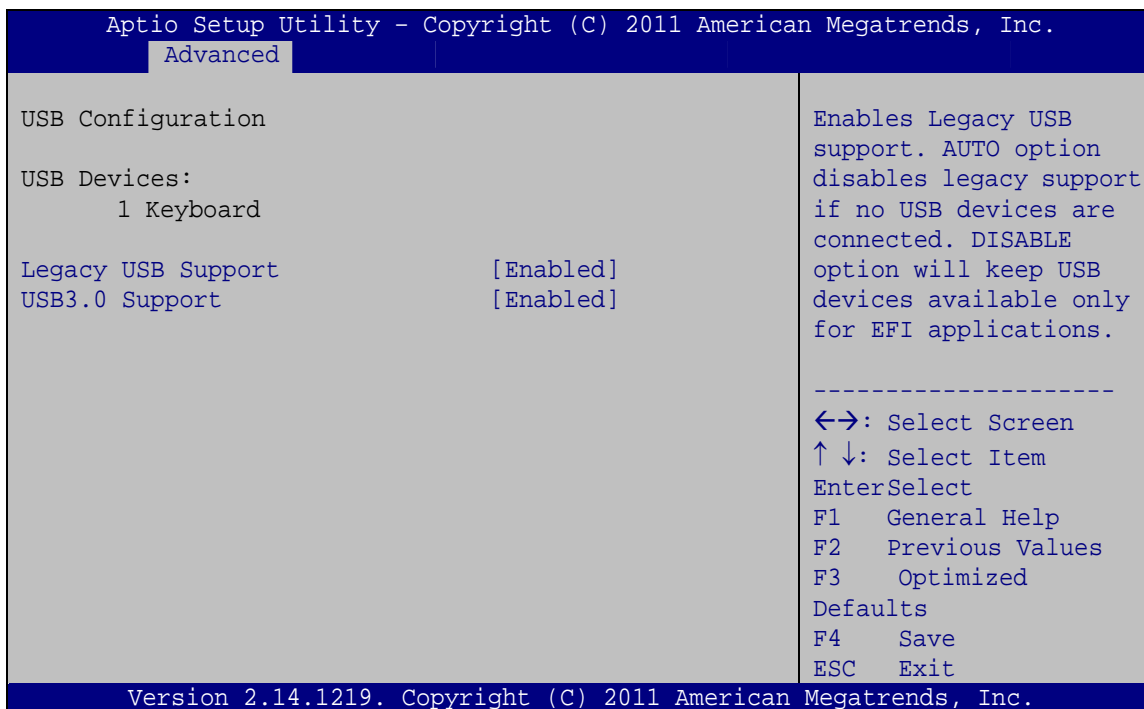
→ Configure SATA as [IDE]

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

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

5.3.5 USB Configuration

Use the **USB Configuration** menu (**BIOS Menu 7**) to read USB configuration information and configure the USB settings.



BIOS Menu 7: USB Configuration

→ USB Devices

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

→ Legacy USB Support [Enabled]

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

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

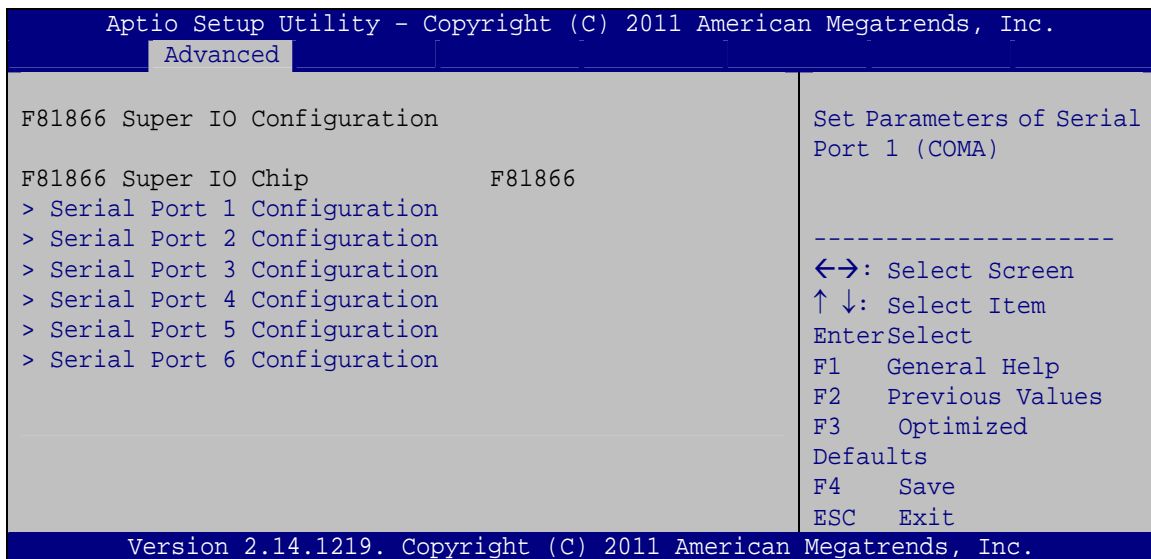
➔ **USB3.0 Support [Enabled]**

Use the **USB3.0 Support** BIOS option to enable or disable the USB 3.0 controller

- ➔ **Enabled** **DEFAULT** USB 3.0 controller enabled
- ➔ **Disabled** USB 3.0 controller disabled

5.3.6 F81866 Super IO Configuration

Use the **F81866 Super IO Configuration** menu (**BIOS Menu 8**) to set or change the configurations for the FDD controllers, parallel ports and serial ports.

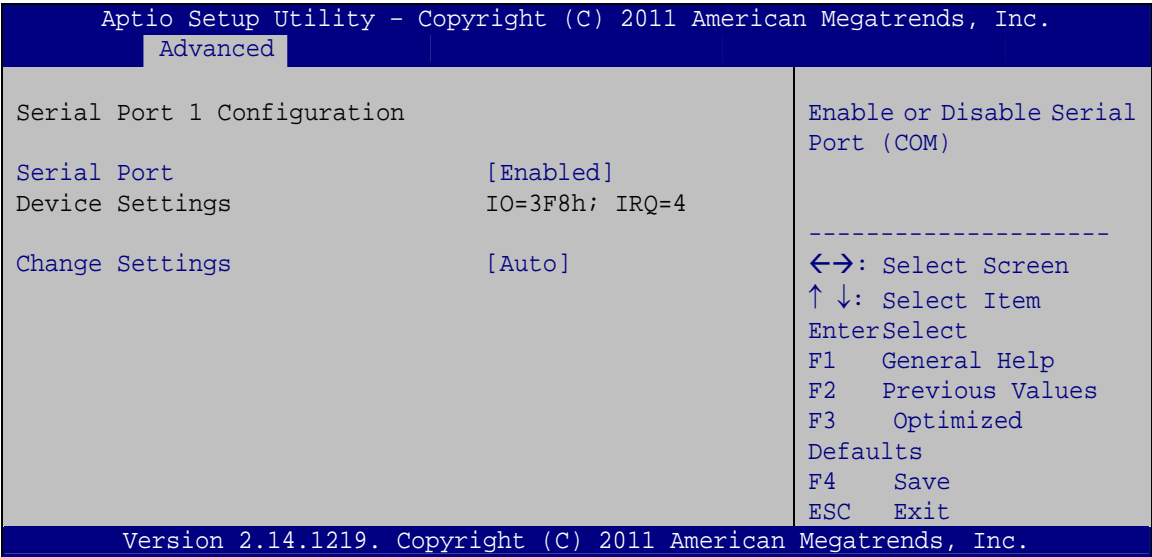


BIOS Menu 8: Super IO Configuration



5.3.6.1 Serial Port n Configuration

Use the **Serial Port n Configuration** menu (**BIOS Menu 9**) to configure the serial port n.



BIOS Menu 9: Serial Port n Configuration Menu

5.3.6.1.1 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



KINO-CV-D25501/N26001 SBC

- | | | |
|---|----------------------|---|
| ➔ | IO=3F8h;
IRQ=3, 4 | Serial Port I/O port address is 3E8h and the interrupt address is IRQ3, 4 |
| ➔ | IO=2F8h;
IRQ=3, 4 | Serial Port I/O port address is 2F8h and the interrupt address is IRQ3, 4 |
| ➔ | IO=3E8h;
IRQ=3, 4 | Serial Port I/O port address is 3E8h and the interrupt address is IRQ3, 4 |
| ➔ | IO=2E8h;
IRQ=3, 4 | Serial Port I/O port address is 2E8h and the interrupt address is IRQ3, 4 |

5.3.6.1.2 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=2E8h;
IRQ=3, 4 | Serial Port I/O port address is 2E8h and the interrupt address is IRQ3, 4 |
| ➔ | IO=3E8h;
IRQ=3, 4 | Serial Port I/O port address is 3E8h and the interrupt address is IRQ3, 4 |



- | | | |
|---|----------------------|---|
| ➔ | IO=2E8h;
IRQ=3, 4 | Serial Port I/O port address is 2E8h and the interrupt address is IRQ3, 4 |
|---|----------------------|---|

5.3.6.1.3 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=10 | Serial Port I/O port address is 3E8h and the interrupt address is IRQ10 |
| ➔ | IO=3F8h;
IRQ=10, 11 | Serial Port I/O port address is 3F8h and the interrupt address is IRQ10, 11 |
| ➔ | IO=2F8h;
IRQ=10, 11 | Serial Port I/O port address is 2F8h and the interrupt address is IRQ10, 11 |
| ➔ | IO=3E8h;
IRQ=10, 11 | Serial Port I/O port address is 3E8h and the interrupt address is IRQ10, 11 |
| ➔ | IO=2E8h;
IRQ=10, 11 | Serial Port I/O port address is 2E8h and the interrupt address is IRQ10, 11 |
| ➔ | IO=250h;
IRQ=10, 11 | Serial Port I/O port address is 250h and the interrupt address is IRQ10, 11 |
| ➔ | IO=2E0h;
IRQ=10, 11 | Serial Port I/O port address is 2E0h and the interrupt address is IRQ10, 11 |



5.3.6.1.4 Serial Port 4 Configuration

→ Serial Port [Enabled]

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

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

→ Change Settings [Auto]

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

- | | | | |
|---|--------------------------------|----------------|---|
| → | Auto | DEFAULT | The serial port IO port address and interrupt address are automatically detected. |
| → | IO=2E8h;
IRQ=10 | | Serial Port I/O port address is 2E8h and the interrupt address is IRQ10 |
| → | IO=3F8h;
IRQ=10, 11 | | Serial Port I/O port address is 3F8h and the interrupt address is IRQ10, 11 |
| → | IO=2F8h;
IRQ=10, 11 | | Serial Port I/O port address is 2F8h and the interrupt address is IRQ10, 11 |
| → | IO=3E8h;
IRQ=10, 11 | | Serial Port I/O port address is 3E8h and the interrupt address is IRQ10, 11 |
| → | IO=2E8h;
IRQ=10, 11 | | Serial Port I/O port address is 2E8h and the interrupt address is IRQ10, 11 |
| → | IO=250h;
IRQ=10, 11 | | Serial Port I/O port address is 250h and the interrupt address is IRQ10, 11 |
| → | IO=2E0h;
IRQ=10, 11 | | Serial Port I/O port address is 2E0h and the interrupt address is IRQ10, 11 |



5.3.6.1.5 Serial Port 5 Configuration

➔ Serial Port [Enabled]

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

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

➔ Change Settings [Auto]

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

- | | | | |
|---|------------------------|---------|---|
| ➔ | Auto | DEFAULT | The serial port IO port address and interrupt address are automatically detected. |
| ➔ | IO=250h;
IRQ=10 | | Serial Port I/O port address is 250h and the interrupt address is IRQ10 |
| ➔ | IO=3F8h;
IRQ=10, 11 | | Serial Port I/O port address is 3F8h and the interrupt address is IRQ10, 11 |
| ➔ | IO=2F8h;
IRQ=10, 11 | | Serial Port I/O port address is 2F8h and the interrupt address is IRQ10, 11 |
| ➔ | IO=3E8h;
IRQ=10, 11 | | Serial Port I/O port address is 3E8h and the interrupt address is IRQ10, 11 |
| ➔ | IO=2E8h;
IRQ=10, 11 | | Serial Port I/O port address is 2E8h and the interrupt address is IRQ10, 11 |
| ➔ | IO=250h;
IRQ=10, 11 | | Serial Port I/O port address is 250h and the interrupt address is IRQ10, 11 |
| ➔ | IO=2E0h;
IRQ=10, 11 | | Serial Port I/O port address is 2E0h and the interrupt address is IRQ10, 11 |



5.3.6.1.6 Serial Port 6 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 |

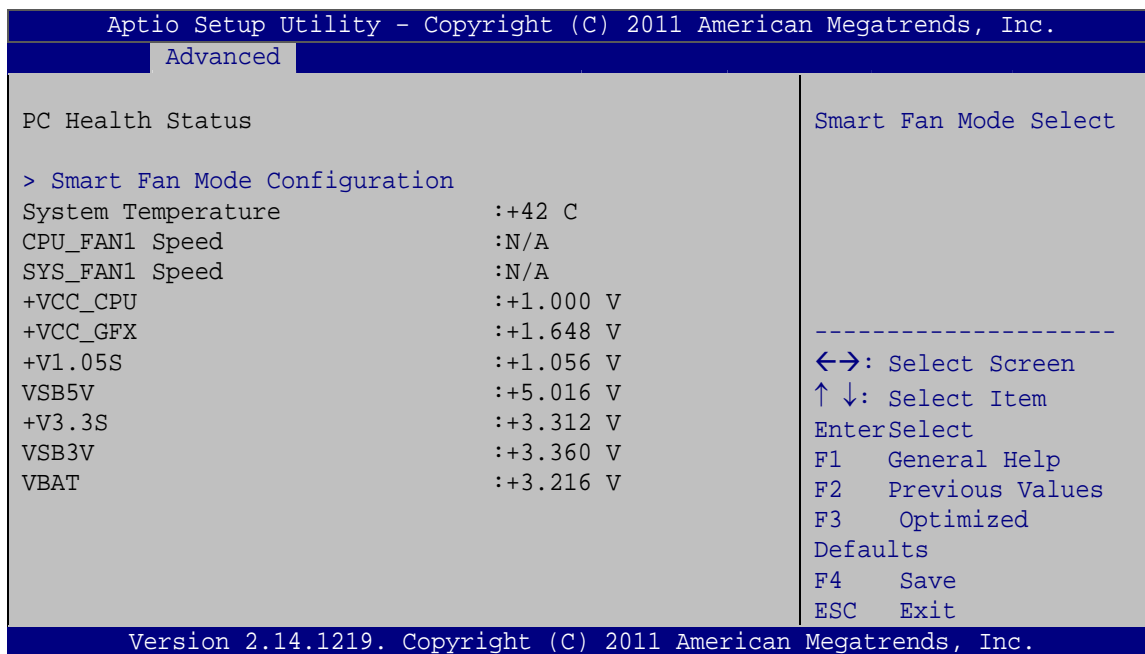
→ Change Settings [Auto]

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=2E0h;
IRQ=10 | | Serial Port I/O port address is 2E0h and the interrupt address is IRQ10 |
| → | IO=3F8h;
IRQ=10, 11 | | Serial Port I/O port address is 3F8h and the interrupt address is IRQ10, 11 |
| → | IO=2F8h;
IRQ=10, 11 | | Serial Port I/O port address is 2F8h and the interrupt address is IRQ10, 11 |
| → | IO=3E8h;
IRQ=10, 11 | | Serial Port I/O port address is 3E8h and the interrupt address is IRQ10, 11 |
| → | IO=2E8h;
IRQ=10, 11 | | Serial Port I/O port address is 2E8h and the interrupt address is IRQ10, 11 |
| → | IO=250h;
IRQ=10, 11 | | Serial Port I/O port address is 250h and the interrupt address is IRQ10, 11 |
| → | IO=2E0h;
IRQ=10, 11 | | Serial Port I/O port address is 2E0h and the interrupt address is IRQ10, 11 |

5.3.7 F81866 H/W Monitor

The **F8186 H/W Monitor** menu (**BIOS Menu 10**) shows the operating temperature, fan speeds and system voltages.



BIOS Menu 10: Hardware Health Configuration

➔ PC Health Status

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

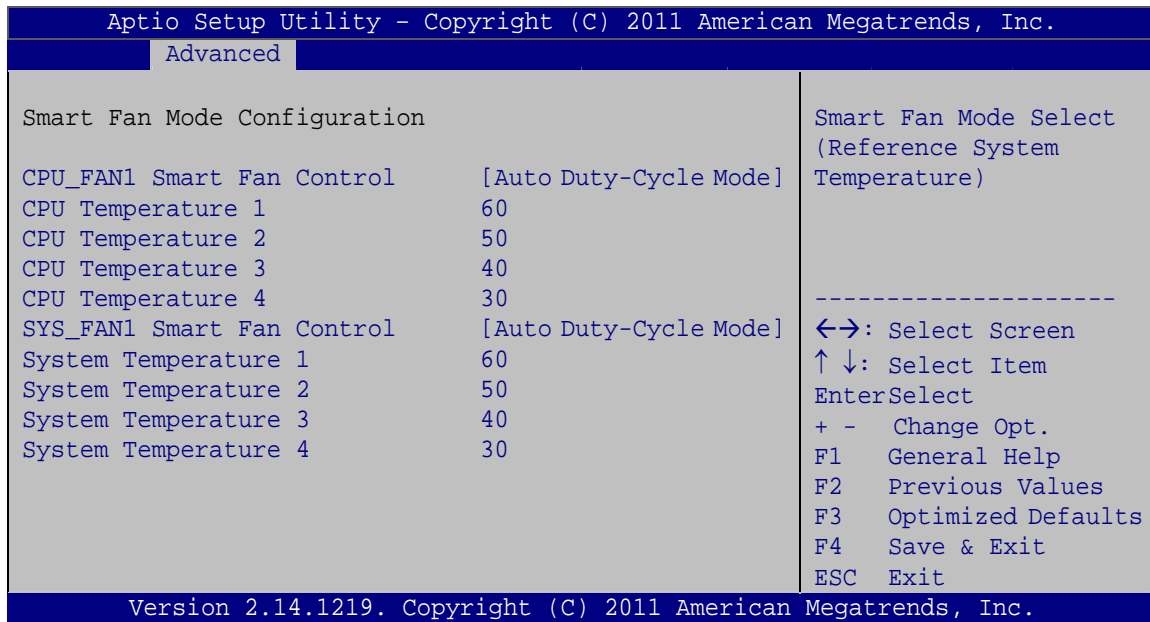
- System Temperatures
- Fan Speeds:
 - CPU Fan Speed
 - System Fan Speed
- Voltages:
 - +VCC_CPU
 - +VCC_GFX
 - +V1.05S
 - VSB5V
 - +V3.3S

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- VSB3V
- VBAT

5.3.7.1 Smart Fan Mode Configuration

Use the **Smart Fan Mode Configuration** submenu (**BIOS Menu 11**) to configure the smart fan temperature and speed settings.

**BIOS Menu 11: FAN 1 Configuration****→ CPU_FAN1 Smart Fan Control [Auto Duty-Cycle Mode]**

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

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

→ **SYS_FAN1 Smart Fan Control [Auto Duty-Cycle Mode]**

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

- | | | |
|---|-----------------------------|---|
| → | Manual Duty Mode | The fan spins at the speed set in Manual by Duty Cycle settings |
| → | Auto Duty-Cycle Mode | The fan adjusts its speed using Auto by Duty-Cycle settings |

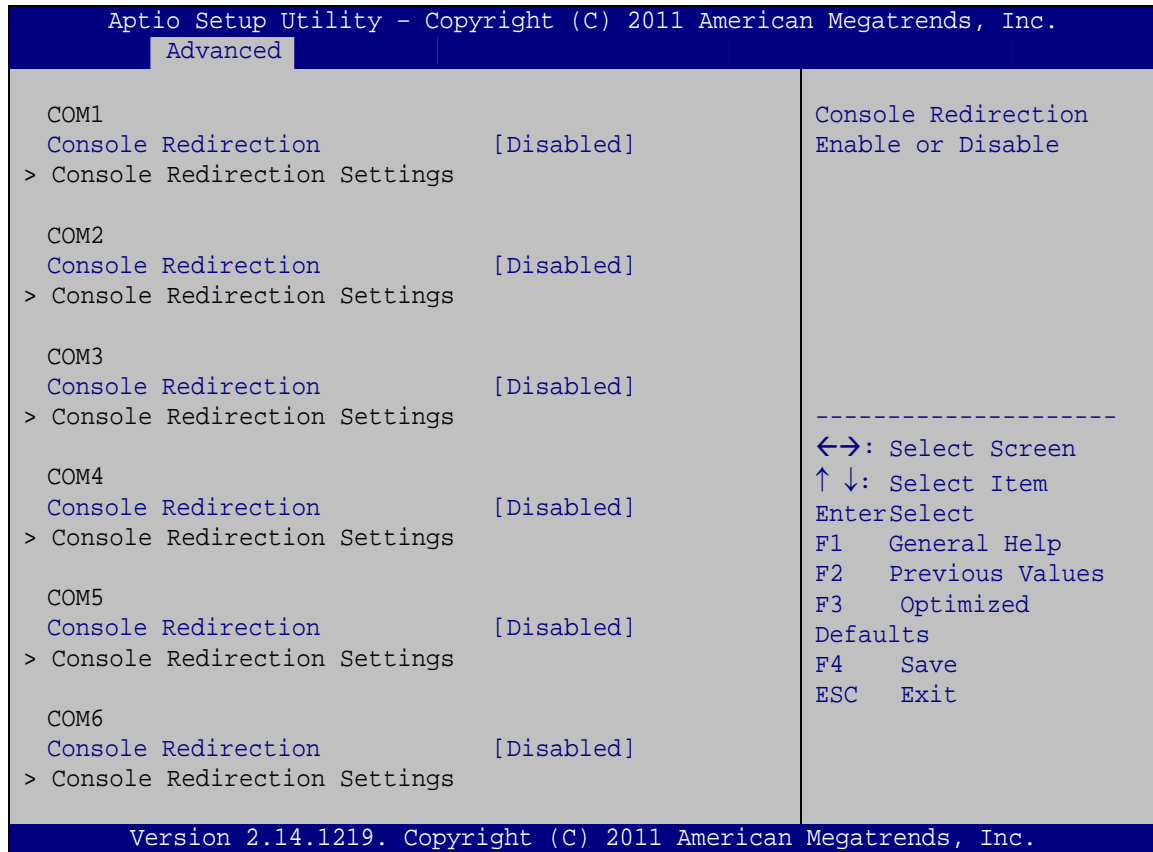
→ **Temperature n**

Use the + or – key to change the fan **Temperature n** value. Enter a decimal number between 0 and 85.

5.3.8 Serial Port Console Redirection

The **Serial Port Console Redirection** menu (**BIOS Menu 12**) 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.

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BIOS Menu 12: Serial Port Console Redirection

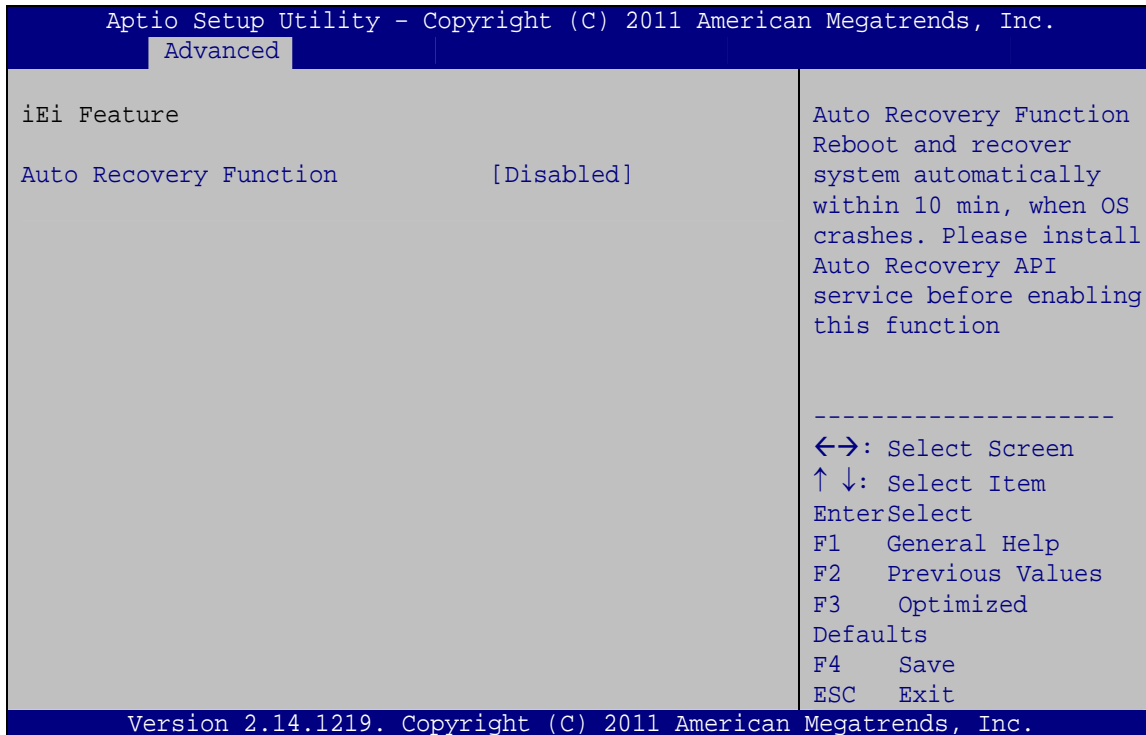
→ Console Redirection [Disabled]

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

5.3.9 IEI Feature

Use the **IEI Feature** menu (**BIOS Menu 13**) to configure One Key Recovery function.



BIOS Menu 13: 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

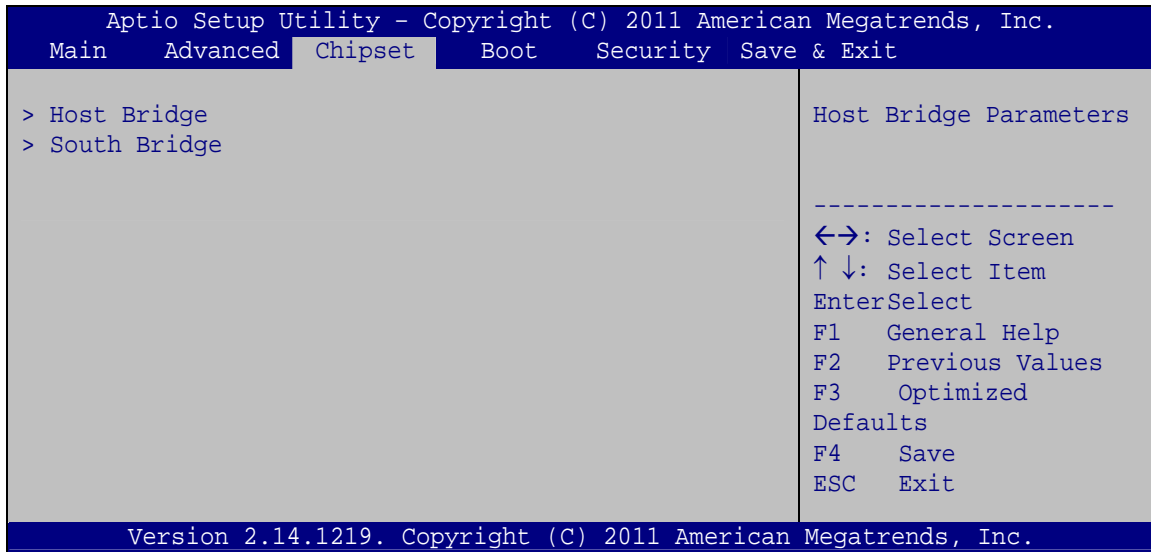
Use the **Chipset** menu (**BIOS Menu 14**) to access the Hostbridge and Southbridge configuration menus



WARNING!

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

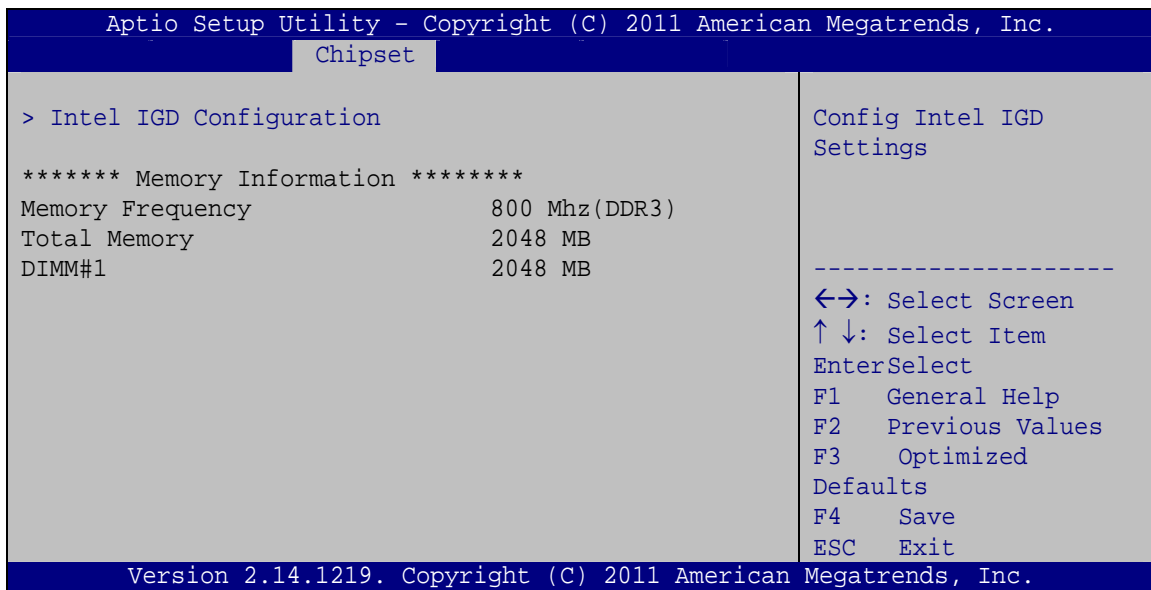
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BIOS Menu 14: Chipset

5.4.1 Host Bridge

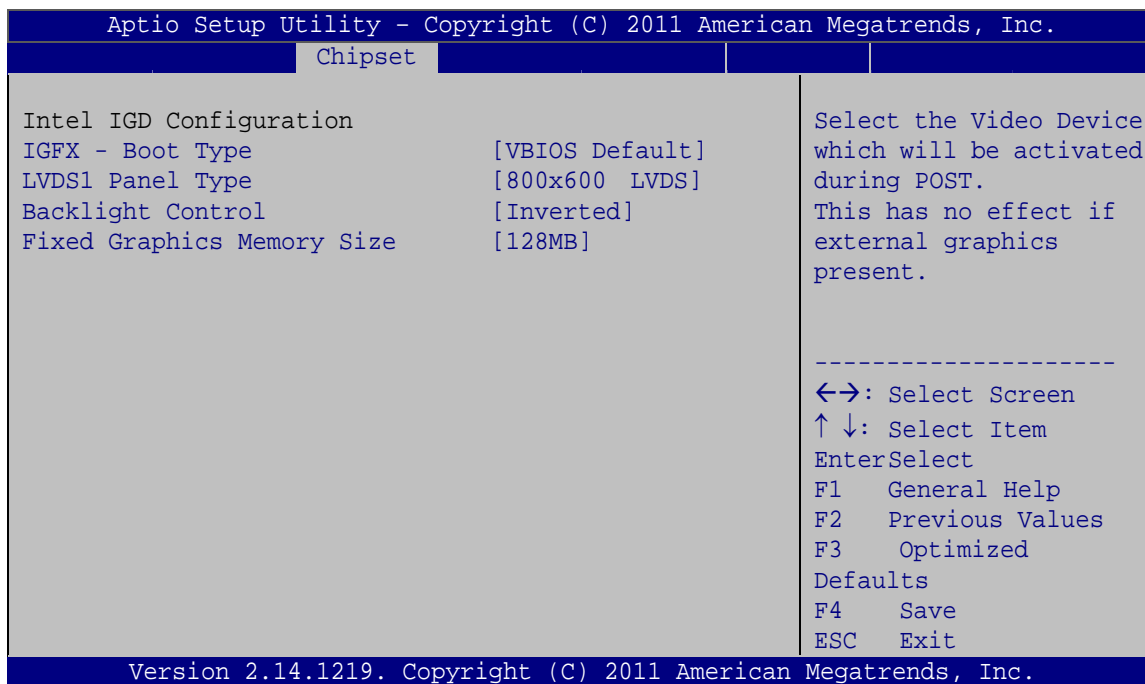
Use the **Host Bridge** menu (**BIOS Menu 15**) to configure the host bridge chipset.



BIOS Menu 15: Host Bridge Configuration

5.4.1.1 Intel IGD Configuration

Use the **Intel IGD Configuration** menu to configure the video device connected to the system.



BIOS Menu 16: Intel IGD SWSCI OpRegion

→ IGFX - Boot Type [VBIOS Default]

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

- VBIOS Default **DEFAULT**
- CRT
- CRT + HDMI
- LVDS1
- LVDS2

→ LVDS1 Panel Type [800x600 LVDS]

Use the **LVDS1 Panel Type** option to select the type of flat panel connected to the system. Configuration options are listed below.

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- 640x480 LVDS
- 800x600 LVDS **DEFAULT**
- 1024x768 LVDS
- 1280x1024 LVDS
- 1366x768 LVDS
- 1224x600 LVDS
- 1280x800 LVDS

→ Backlight Control [Inverted]

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

- Normal** The LVDS backlight is brighter at low voltage level.
- Inverted** **DEFAULT** The LVDS backlight is brighter at high voltage level.

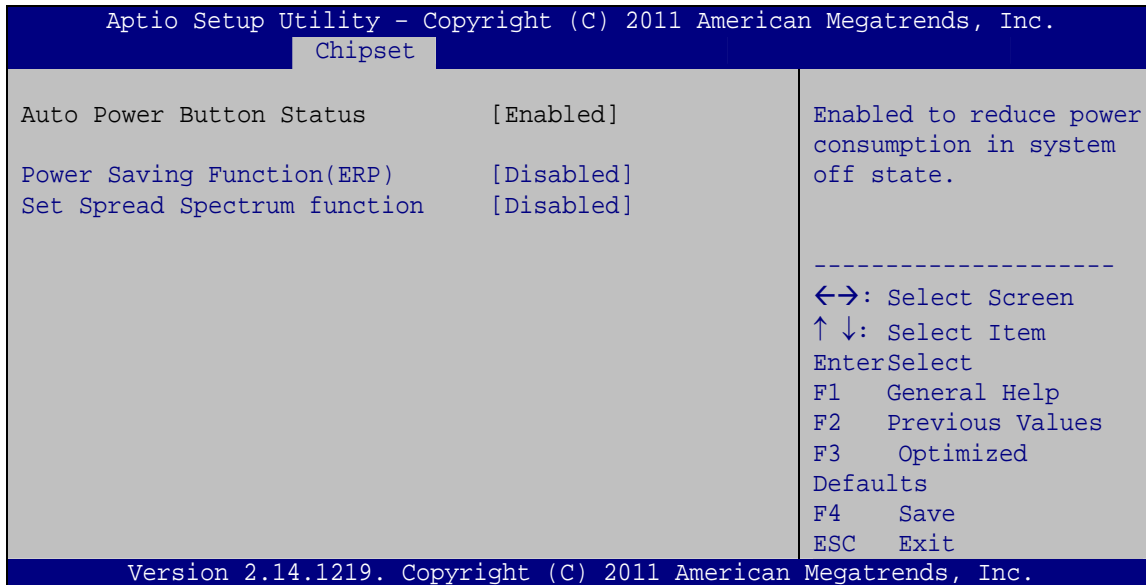
→ Fixed Graphics Memory Size [128MB]

Use the **Fixed Graphics Memory Size** option to specify the maximum amount of memory that can be allocated as graphics memory. Configuration options are listed below.

- 128 MB **Default**
- 256 MB

5.4.2 South Bridge

Use the **South Bridge** menu (**BIOS Menu 17**) to configure the Southbridge chipset.



BIOS Menu 17: Southbridge Chipset Configuration

➔ Power Saving Function(ERP) [Disabled]

Use the **Power Saving Function(ERP)** BIOS option to enable or disable the power saving function.

- ➔ **Disabled** **DEFAULT** Power saving function is disabled.
- ➔ **Enabled** Power saving function is enabled. It will reduce power consumption when the system is off.

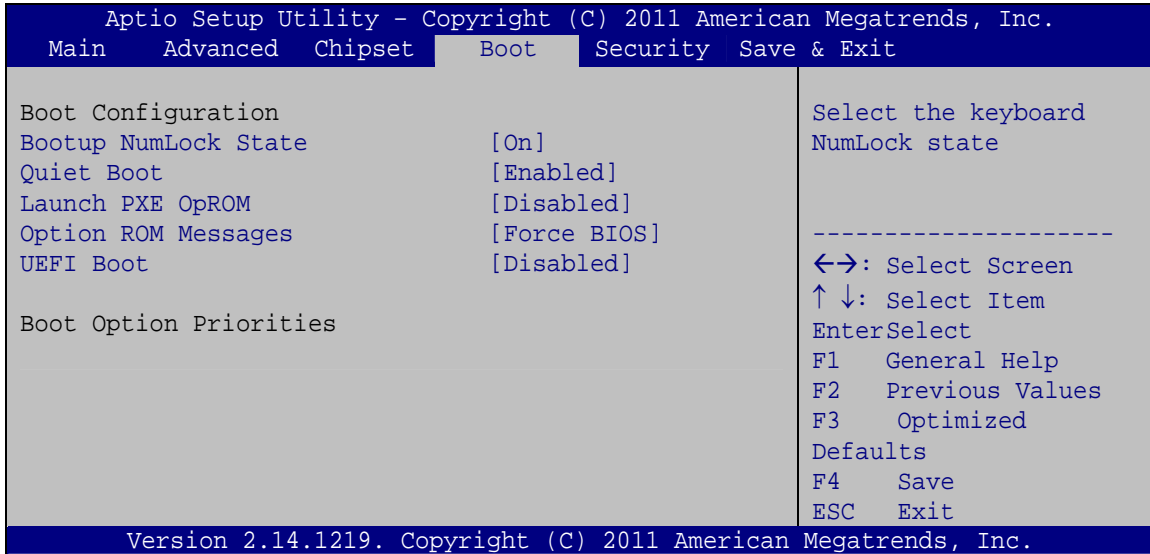
➔ Set Spread Spectrum Function [Disabled]

The **Set Spread Spectrum Function** option can help to improve CPU EMI issues.

- ➔ **Disabled** **DEFAULT** The spread spectrum function is disabled
- ➔ **Enabled** The spread spectrum function is enabled

5.5 Boot

Use the **Boot** menu (**BIOS Menu 18**) to configure system boot options.



BIOS Menu 18: 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.

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

→ **Launch PXE OpROM [Disabled]**

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

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

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

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

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

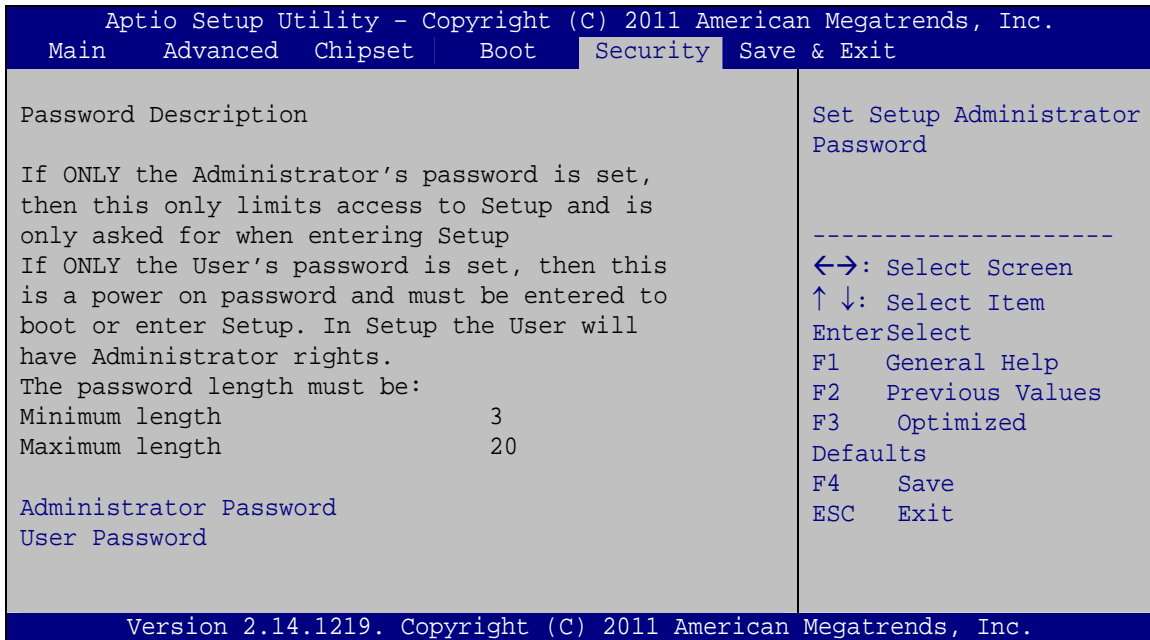
→ **UEFI Boot [Disabled]**

Use the **UEFI Boot** option to enable or disable to boot from the UEFI devices.

- **Disabled** **DEFAULT** Boot from UEFI devices is disabled.
- **Enabled** Boot from UEFI devices is enabled.

5.6 Security

Use the **Security** menu (**BIOS Menu 19**) to set system and user passwords.



BIOS Menu 19: Security

➔ Administrator Password

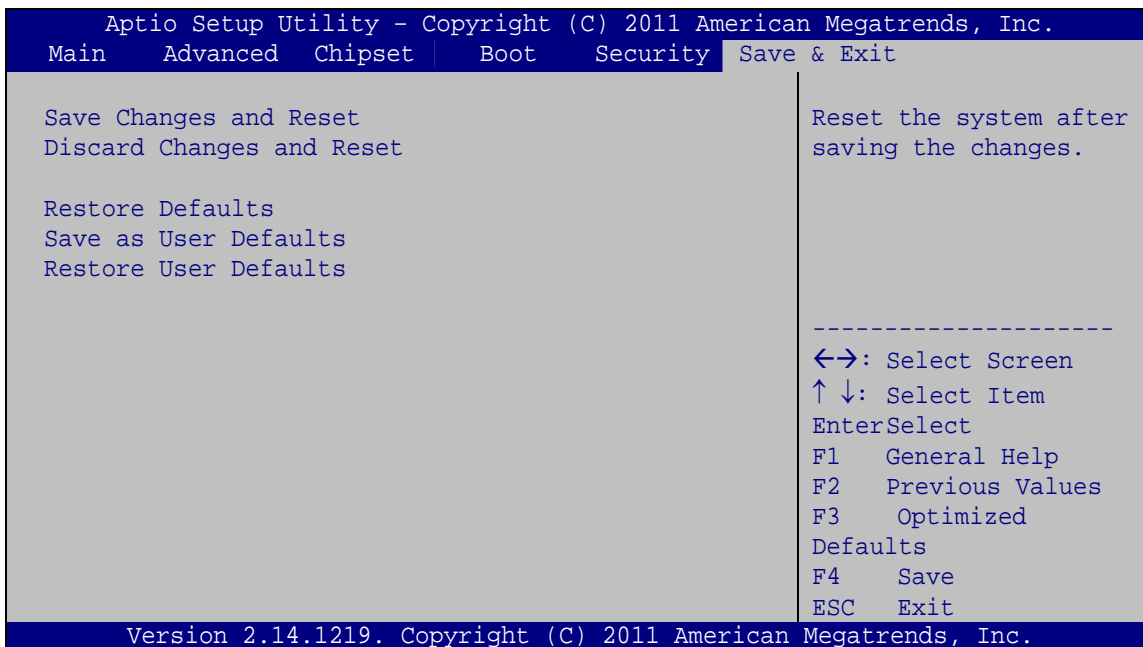
Use the **Administrator Password** to set or change a administrator password.

➔ User Password

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

5.7 Exit

Use the **Exit** menu (**BIOS Menu 20**) to load default BIOS values, optimal failsafe values and to save configuration changes.



BIOS Menu 20: Exit

→ Save Changes and Reset

Use the **Save Changes and Reset** option to save the changes made to the BIOS options and to exit the BIOS configuration setup program.

→ 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.

Appendix

A

BIOS Options



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

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Appendix

B

Terminology

KINO-CV-D25501/N26001 SBC

AC '97	Audio Codec 97 (AC'97) refers to a codec standard developed by Intel® in 1997.
ACPI	Advanced Configuration and Power Interface (ACPI) is an OS-directed configuration, power management, and thermal management interface.
AHCI	Advanced Host Controller Interface (AHCI) is a SATA Host controller register-level interface.
ATA	The Advanced Technology Attachment (ATA) interface connects storage devices including hard disks and CD-ROM drives to a computer.
ARMD	An ATAPI Removable Media Device (ARMD) is any ATAPI device that supports removable media, besides CD and DVD drives.
ASKIR	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.
BIOS	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
CODEC	The Compressor-Decompressor (CODEC) encodes and decodes digital audio data on the system.
CompactFlash®	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.
CMOS	Complimentary metal-oxide-conductor is an integrated circuit used in chips like static RAM and microprocessors.
COM	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.
DAC	The Digital-to-Analog Converter (DAC) converts digital signals to analog signals.
DDR	Double Data Rate refers to a data bus transferring data on both the rising and falling edges of the clock signal.

DMA	Direct Memory Access (DMA) enables some peripheral devices to bypass the system processor and communicate directly with the system memory.
DIMM	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.
DIO	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.
EHCI	The Enhanced Host Controller Interface (EHCI) specification is a register-level interface description for USB 2.0 Host Controllers.
EIDE	Enhanced IDE (EIDE) is a newer IDE interface standard that has data transfer rates between 4.0 MBps and 16.6 MBps.
EIST	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.
FSB	The Front Side Bus (FSB) is the bi-directional communication channel between the processor and the Northbridge chipset.
GbE	Gigabit Ethernet (GbE) is an Ethernet version that transfers data at 1.0 Gbps and complies with the IEEE 802.3-2005 standard.
GPIO	General purpose input
HDD	Hard disk drive (HDD) is a type of magnetic, non-volatile computer storage device that stores digitally encoded data.
ICH	The Input/Output Control Hub (ICH) is an Intel® Southbridge chipset.
IrDA	Infrared Data Association (IrDA) specify infrared data transmission protocols used to enable electronic devices to wirelessly communicate with each other.
L1 Cache	The Level 1 Cache (L1 Cache) is a small memory cache built into the system processor.
L2 Cache	The Level 2 Cache (L2 Cache) is an external processor memory cache.

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LCD	Liquid crystal display (LCD) is a flat, low-power display device that consists of two polarizing plates with a liquid crystal panel in between.
LVDS	Low-voltage differential signaling (LVDS) is a dual-wire, high-speed differential electrical signaling system commonly used to connect LCD displays to a computer.
POST	The Power-on Self Test (POST) is the pre-boot actions the system performs when the system is turned-on.
RAM	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.
SATA	Serial ATA (SATA) is a serial communications bus designed for data transfers between storage devices and the computer chipsets. The SATA bus has transfer speeds up to 1.5 Gbps and the SATA II bus has data transfer speeds of up to 3.0 Gbps.
S.M.A.R.T	Self Monitoring Analysis and Reporting Technology (S.M.A.R.T) refers to automatic status checking technology implemented on hard disk drives.
UART	Universal Asynchronous Receiver-transmitter (UART) is responsible for asynchronous communications on the system and manages the system's serial communication (COM) ports.
UHCI	The Universal Host Controller Interface (UHCI) specification is a register-level interface description for USB 1.1 Host Controllers.
USB	The Universal Serial Bus (USB) is an external bus standard for interfacing devices. USB 1.1 supports 12Mbps data transfer rates and USB 2.0 supports 480Mbps data transfer rates.
VGA	The Video Graphics Array (VGA) is a graphics display system developed by IBM.

Appendix

C

Digital I/O Interface

KINO-CV-D25501/N26001 SBC**C.1 Introduction**

The DIO connector on the KINO-CV-D25501/N26001 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.

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

INT 15H:

AH – 6FH
<u>Sub-function:</u>
AL – 8 : Set the digital port as INPUT
AL : Digital I/O input value



C.2 Assembly Language Sample 1

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

AL low byte = value

AH – 6FH	
<u>Sub-function:</u>	
AL – 9	:Set the digital port as OUTPUT
BL	:Digital I/O input value

C.3 Assembly Language Sample 2

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

Digital Output is 1001b



Appendix

D

Hazardous Materials Disclosure

D.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.

KINO-CV-D25501/N26001 SBC

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>						

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

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

部件名称	有毒有害物质或元素					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (CR(VI))	多溴联苯 (PBB)	多溴二苯 醚 (PBDE)
壳体	O	O	O	O	O	O
显示	O	O	O	O	O	O
印刷电路板	O	O	O	O	O	O
金属螺帽	O	O	O	O	O	O
电缆组装	O	O	O	O	O	O
风扇组装	O	O	O	O	O	O
电力供应组装	O	O	O	O	O	O
电池	O	O	O	O	O	O
O: 表示该有毒有害物质在该部件所有物质材料中的含量均在 SJ/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。						