

MODEL:
KINO-HM551

Mini-ITX SBC Supports Socket G1 for Intel® mobile Core™ i7/i5/i3 and Intel® Celeron®, VGA/DVI/LVDS/HDMI Display, Dual GbE, Eight USB 2.0, Dual PCIe Mini, Four SATA 3Gb/s, Audio, RoHS

User Manual

Revision

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22 October, 2014	1.03	Added Section 3.2.19: SPI Flash Connector Minor update
15 February, 2012	1.02	Updated Table 3-6: Fan Connector Pinouts
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Chapter

1

Introduction

1.1 Introduction

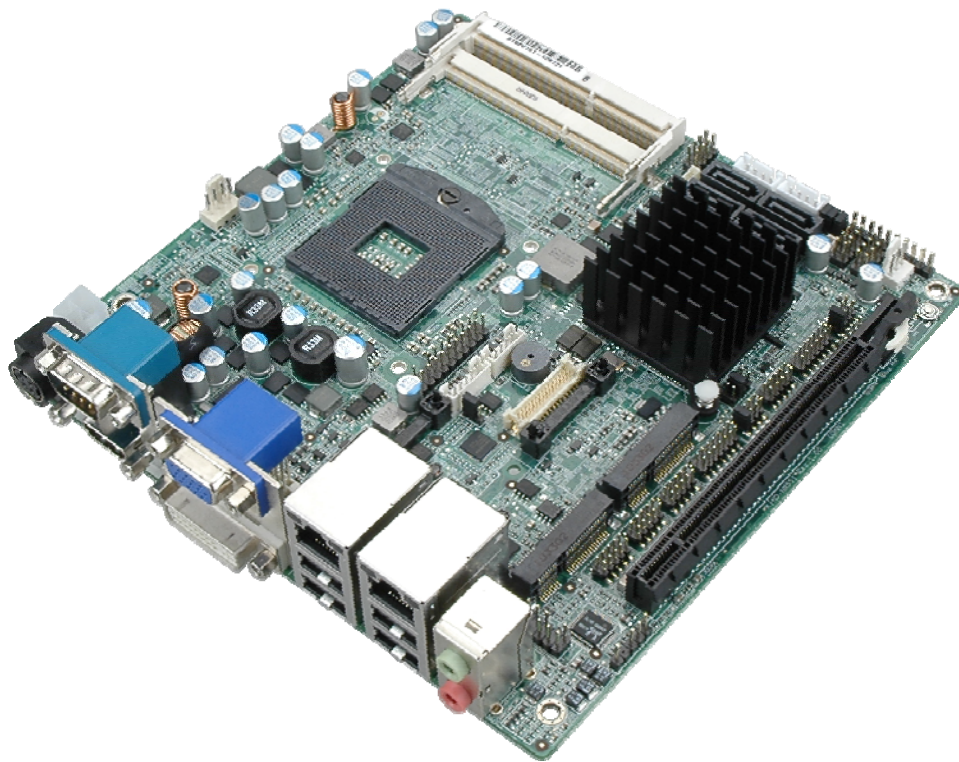


Figure 1-1: KINO-HM551

The KINO-HM551 motherboard is a Socket G1 32nm Intel® Core™ i3, i5 and i7 processor platform. Two SO-DIMM sockets support up to 8 GB of 800 MHz or 1066 MHz DDR3 SDRAM memory.

The integrated Intel® HM55 Express Chipset supports two GbE LAN ports through dual Realtek RTL8111E Ethernet controllers (ASF 2.0 support on LAN1). The KINO-HM551 also supports four SATA 3Gb/s drives and provides 5 V SATA power.

The KINO-HM551 supports dual display via VGA, HDMI and an internal LVDS connector. Eight USB 2.0 channels and two PCIe Mini expansion sockets provide flexible expansion options. High Definition Audio (HDA) support ensures HDA devices can be easily implemented on the KINO-HM551. Serial device connectivity is provided by three internal RS-232, one external RS-232, and two internal RS-232/422/485 connectors.

KINO-HM551**1.2 Connectors**

The connectors on the KINO-HM551 are shown in the figure below.

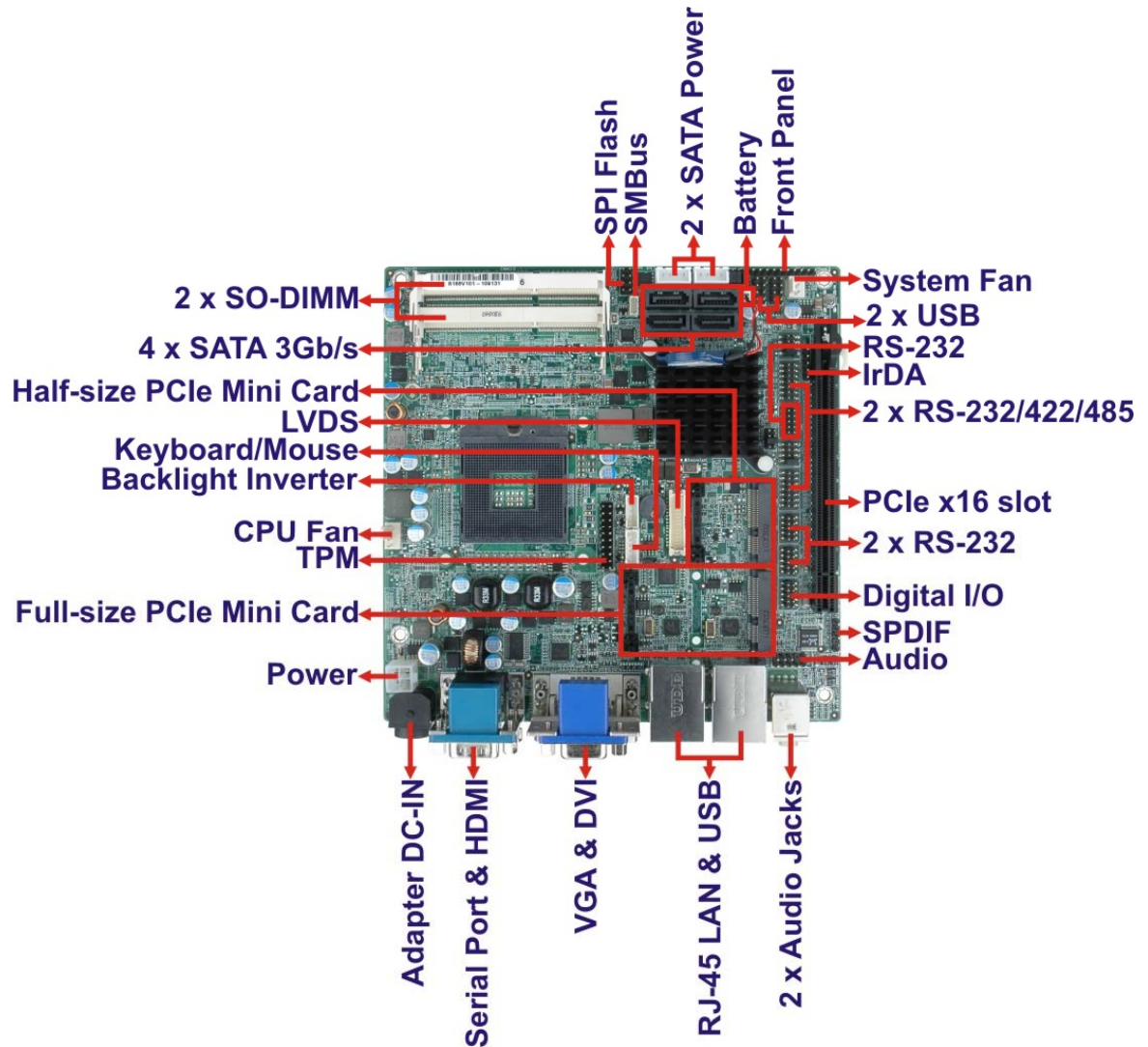


Figure 1-2: Connectors

1.3 Dimensions

The dimensions of the board are listed below:

- **Length:** 170 mm
- **Width:** 170 mm

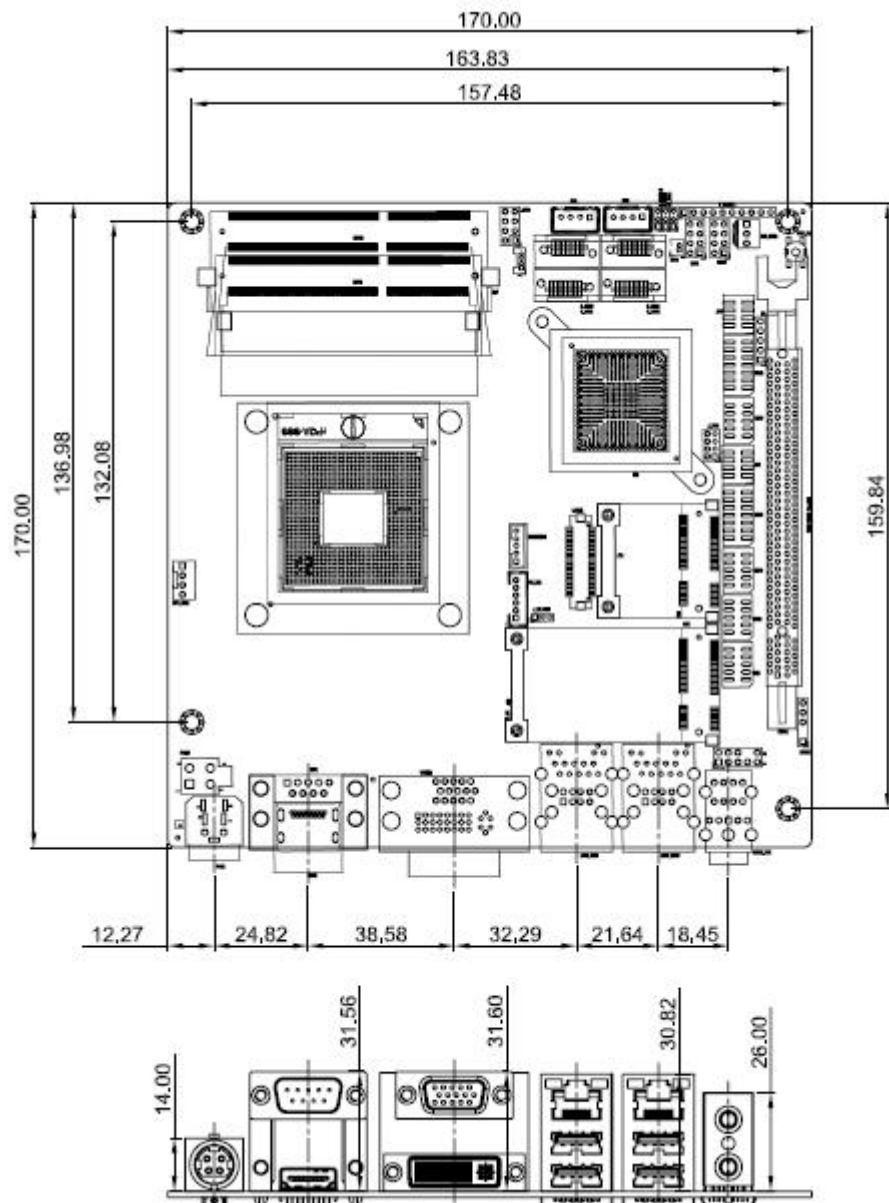


Figure 1-3: KINO-HM551 Dimensions (mm)

KINO-HM551

1.4 Data Flow

Figure 1-4 shows the data flow between the two on-board chipsets and other components installed on the motherboard and described in the following sections of this chapter.

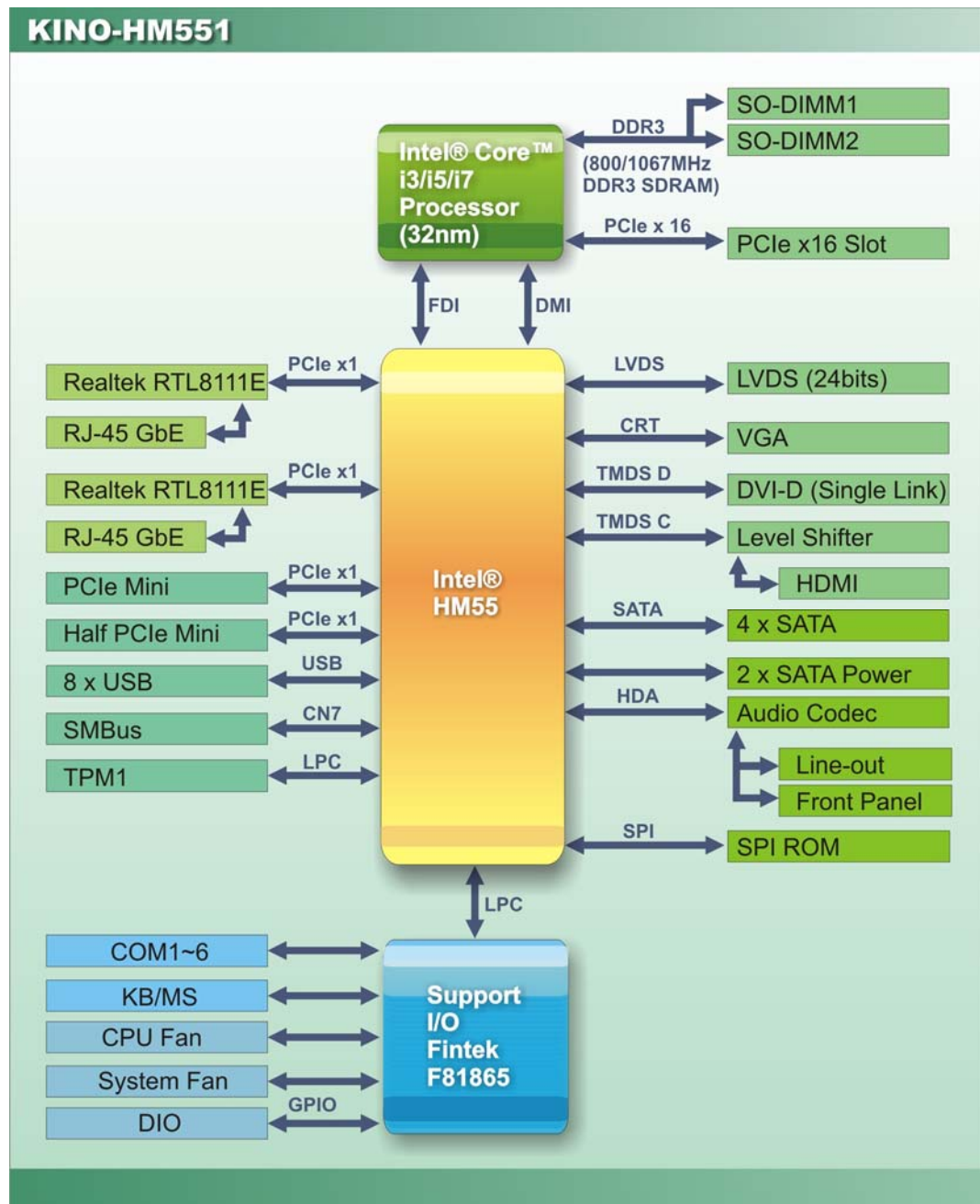


Figure 1-4: Data Flow Block Diagram



1.5 Technical Specifications

KINO-HM551 technical specifications are listed in table below.

Specification	KINO-HM551
Form Factor	Mini-ITX
Socket	Socket G1 (rPGA989) Socket 988A
CPU Supported	32 nm Intel® Core™ i3 processor 32 nm Intel® Core™ i5 processor 32 nm Intel® Core™ i7 processor (i7 processors without integrated graphics) Intel® Celeron® processor
Express Chipset	Intel® HM55
Memory	Two 204-pin SO-DIMM sockets support 800/1066 MHz 4.0 GB (max.) dual-channel DDR3 SDRAM SO-DIMM (system max. 8GB)
Audio	Realtek ALC888 HD 7.1 channel audio codec
LAN	Dual Realtek RTL8111E PCIe GbE controllers with ASF 2.0 support on LAN1
Super I/O	Fintek F81865
BIOS	AMI uEFI BIOS label
Watchdog Timer	Software programmable supports 1~255 sec. system reset
Expansion	
PCIe	Two PCIe Mini slot
I/O Interface Connectors	
Audio Connector	One internal audio connector (10-pin header)



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Specification	KINO-HM551
Display Ports	One VGA port (2048x1536) One HDMI port (up to 1080p) One internal LVDS connector (1600x1200) One DVI-D port (1600x1200)
Ethernet	Two RJ-45 GbE ports
Serial Ports	Three RS-232 via three 10-pin headers One external RS-232 serial connector via DB-9 male Two RS-232/422/485 via 14-pin header
USB 2.0/1.1 Ports	Four external USB ports Four internal USB ports via two 8-pin headers
Storage	
Serial ATA	Four SATA 3.0 Gb/s connectors Two 5 V SATA power connectors
Environmental and Power Specifications	
Power Supply	12 V DC input only ATX and AT power supported
Power Connector	One external DIN 4-pin DC jack One internal 4-pin Molex power connector for power supply
Power Consumption	12V@4.67A (2.66 GHz Intel® Core™ i7 620M CPU with two 1333 MHz 4 GB DDR3 SO-DIMM)
Operating Temperature	-10°C ~ 60°C (requires cooler and silicone heat sink paste)
Humidity	5% ~ 95% (non-condensing)
Physical Specifications	
Dimensions	170 mm x 170 mm
Weight GW/NW	900 g / 450 g

Table 1-1: Technical Specifications

Chapter

2

Unpacking

KINO-HM551

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-HM551 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-HM551 was purchased from or contact an IEI sales representative directly by sending an email to sales@ieiworld.com.

The KINO-HM551 is shipped with the following components:







Quantity	Item and Part Number	Image
1	KINO-HM551 motherboard	
1	Dual RS-232 cable (P/N: 19800-000112-RS)	
2	SATA and power cable (P/N: 32801-000100-300-RS)	
1	I/O shielding (P/N: 45014-0032C0-00-RS)	
1	Mini jumper pack (2.0mm) (P/N: 33101-000657-RS)	
1	Utility CD	

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1	One Key Recovery CD	
1	Quick Installation Guide	

2.3.1 Optional Items

The following are optional components which may be separately purchased:

Item and Part Number	Image
CPU cooler for 55 W mobile processor (P/N: CF-989A-RS-R12)	
Dual USB cable (with bracket) (P/N: 19800-003100-300-RS)	
RS-232/422/485 cable (with bracket) (P/N: 19800-004300-100-RS)	
SATA to IDE/CompactFlash® converter board (P/N: SAIDE-KIT01-R10)	
Keyboard/Mouse cable (P/N: 32000-023800-RS)	
Infineon TPM module (P/N: TPM-IN01-R11)	

Chapter

3

Connectors

KINO-HM551

3.1 Peripheral Interface Connectors

This chapter details all the jumpers and connectors.

3.1.1 KINO-HM551 Layout

The figures below show all the connectors and jumpers.

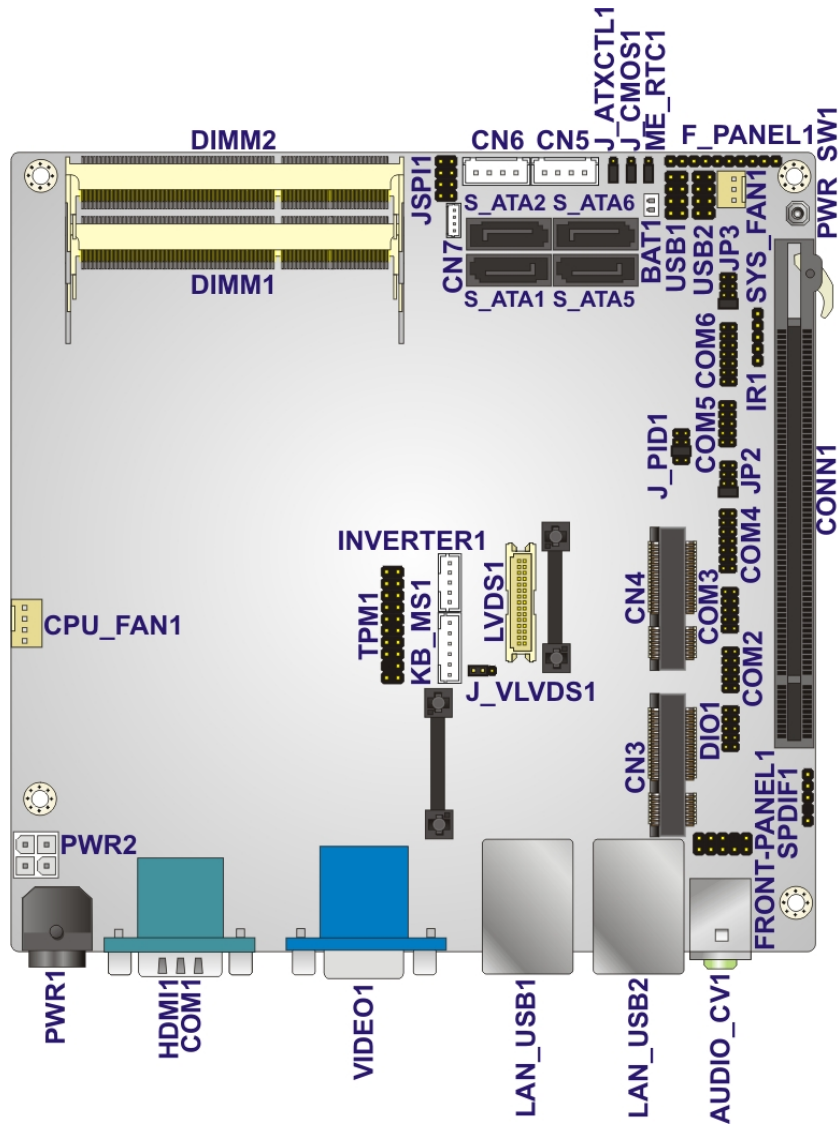


Figure 3-1: Connector and Jumper Locations



3.1.2 Peripheral Interface Connectors

The table below lists all the connectors on the board.

Connector	Type	Label
Audio connector	10-pin header	FRONT-PANEL1
Digital I/O connector	10-pin header	DIO1
Fan connector (CPU)	4-pin wafer	CPU_FAN1
Fan connector (system)	3-pin wafer	SYS_FAN1
Front Panel indicators	10-pin header	F_PANEL1
Infrared connector	5-pin header	IR1
Inverter connector	5-pin wafer	INVERTER1
Keyboard and mouse connector	6-pin wafer	KB_MS1
LVDS connector	30-pin crimp	LVDS1
PCIe Mini card slot (full-size)	PCIe Mini card slot	CN3
PCIe Mini card slot (half-size)	PCIe Mini card slot	CN4
Power supply connector	4-pin connector	PWR2
RS-232/422/485 serial port connector	14-pin header	COM4, COM6
RS-232 serial port connector	10-pin header	COM2, COM3, COM5
Serial ATA (SATA) drive connector	7-pin SATA	S_ATA1, S_ATA2, S_ATA5, S_ATA6
SATA power connector	4-pin wafer	CN5, CN6
SMBus connector	4-pin wafer	CN7
SPDIF connector	5-pin header	SPDIF1
SPI flash connector	8-pin header	JSPI1
TPM connector	20-pin connector	TPM1



KINO-HM551

USB connectors	8-pin header	USB1, USB2
----------------	--------------	------------

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

The table below lists the connectors on the external I/O panel.

Connector	Type	Label
Adapter connector	4-pin connector	PWR1
Audio connector	Audio jack	AUDIO_CV1
Ethernet and USB connector	RJ-45, USB port	LAN1_USB1, LAN2_USB2
HDMI	HDMI port	HDMI1
Serial Port DB-9 port connector	DB-9 Male	COM1
VGA and DVI connector	15-pin Female, 24-pin Female	VIDEO1

Table 3-2: Rear Panel Connectors**3.2 Internal Peripheral Connectors**

The section describes all of the connectors on the KINO-HM551.

3.2.1 Audio Connector

CN Label: FRONT-PANEL1

CN Type: 10-pin header

CN Location: See **Figure 3-2**

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

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

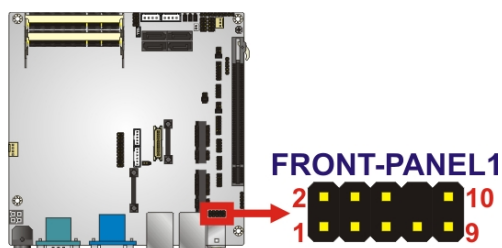


Figure 3-2: Audio Connector Location

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	MIC-L	2	ANALOG GND
3	MIC-R	4	PRESENCE#
5	LINE-R	6	MIC-JD
7	FRONT-10	8	NC
9	LINE-L	10	INE-JD

Table 3-3: Audio Connector Pinouts

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.

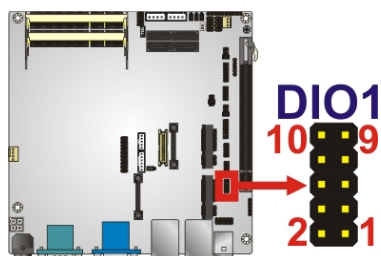


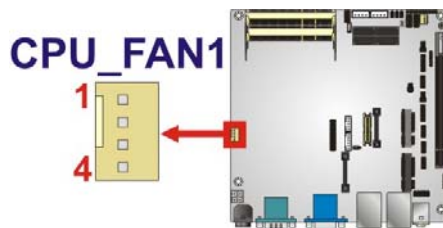
Figure 3-3: Digital I/O Connector Location

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PIN NO.	DESCRIPTION	PIN NO.	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 Connector (CPU)****CN Label:** CPU_FAN1**CN Type:** 4-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 NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	+12V
3	Rotation Signal	4	PWM Control Signal

Table 3-5: Fan Connector Pinouts**3.2.4 Fan Connector (System)****CN Label:** SYS_FAN1**CN Type:** 3-pin wafer**CN Location:** See **Figure 3-5**

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

The fan connector attaches a cooling fan.

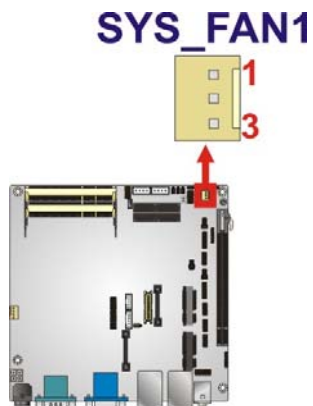


Figure 3-5: Fan Connector Locations

PIN NO.	DESCRIPTION
1	GND
2	+ 12V
3	Rotation Signal

Table 3-6: Fan Connector Pinouts

3.2.5 Front Panel Indicators

CN Label: **F_PANEL1**

CN Type: 10-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.

KINO-HM551

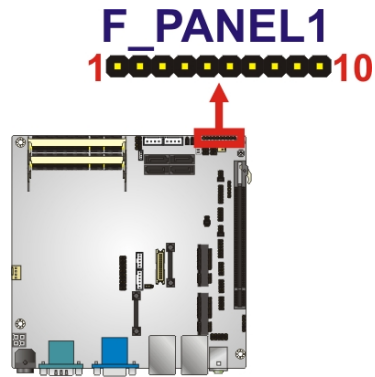


Figure 3-6: Front Panel Indicator Location

FUNCTION	PIN NO.	DESCRIPTION	FUNCTION	PIN NO.	DESCRIPTION
	1	NC	Power LED Indicator	6	PWR_LED+
Power Button	2	PWR_BTN+		7	PWR_LED+
	3	PWR_BTN-		8	PWR_LED-
HDD LED Indicator	4	HDD_LED+	Reset	9	RESET+
	5	HDD_LED-		10	RESET-

Table 3-7: Front Panel Indicator Pinouts

3.2.6 Infrared Connector

CN Label:	IR1
CN Type:	5-pin header
CN Location:	See Figure 3-7
CN Pinouts:	See Table 3-8

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

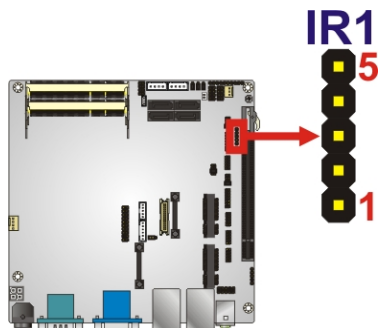


Figure 3-7: Infrared Connector Locations

PIN NO.	DESCRIPTION	PIN NO.	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 3-8: Infrared Connector Pinouts

3.2.7 Inverter Connector

CN Label:	INVERTER1
CN Type:	5-pin wafer
CN Location:	See Figure 3-8
CN Pinouts:	See Table 3-9

The inverter connector provides power to an LCD panel.

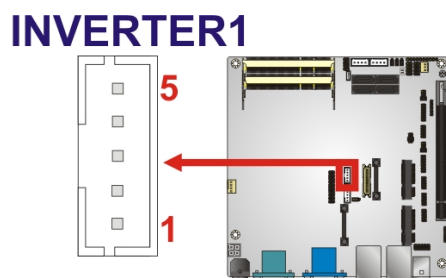


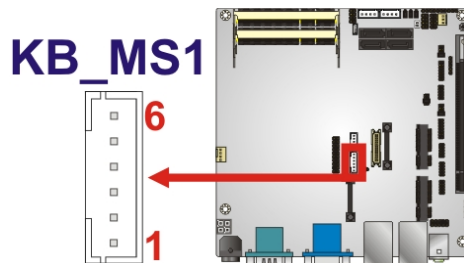
Figure 3-8: Inverter Connector Location

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PIN NO.	DESCRIPTION
1	BRIGHTNESS
2	GROUND
3	+12V
4	GROUND
5	BACKLIGHT ENABLE

Table 3-9: Inverter Connector Pinouts**3.2.8 Keyboard/Mouse Connector****CN Label:** KB_MS1**CN Type:** 6-pin wafer**CN Location:** See **Figure 3-9****CN Pinouts:** See **Table 3-10**

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

**Figure 3-9: Keyboard/Mouse Connector Location**

PIN NO.	DESCRIPTION
1	VCC5_KBMS
2	MSDATA
3	MSCLK
4	KBDATA
5	KBCLK
6	KBGND

Table 3-10: Keyboard/Mouse Connector Pinouts

3.2.9 LVDS Connector

- CN Label:

LVDS1
- CN Type:

30-pin crimp
- CN Location:

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

See **Table 3-11**

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

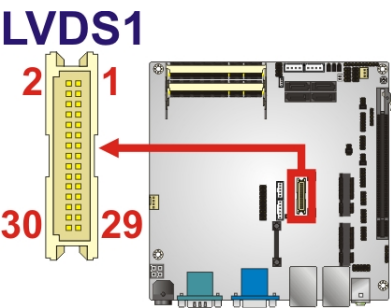


Figure 3-10: LVDS Connector Locations

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GROUND	2	GROUND
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	GROUND	14	GROUND
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	GROUND	26	GROUND
27	+LCD VCC	28	+LCD VCC

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PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
29	+LCD VCC	30	+LCD VCC

Table 3-11: LVDS Connector Pinouts**3.2.10 PCIe Mini Card Slot (Full-size)**

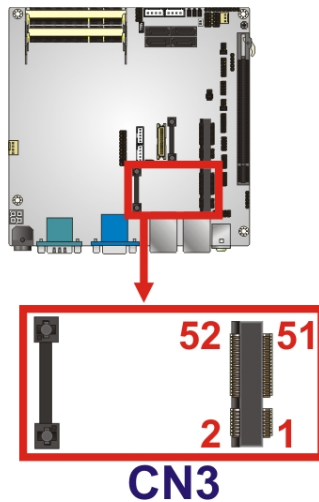
CN Label: CN3

CN Type: Full-size PCIe Mini card slot

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

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

The PCIe Mini card slot is for installing PCIe Mini expansion cards.

**Figure 3-11: Full-size PCIe Mini Card Slot Connector Location**

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	PCIE_WAKE#	2	VCC3
3	N/C	4	GND
5	N/C	6	1.5 V
7	N/C	8	N/C
9	GND	10	N/C
11	CLK-	12	N/C
13	CLK+	14	N/C

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
15	GND	16	N/C
17	PCIRST#	18	GND
19	N/C	20	VCC3
21	GND	22	PCIRST#
23	PERN2	24	3VDual
25	PERP2	26	GND
27	GND	28	1.5 V
29	GND	30	SMBCLK
31	PETN2	32	SMBDATA
33	PETP2	34	GND
35	GND	36	USB D-
37	N/C	38	USB D+
39	N/C	40	GND
41	N/C	42	N/C
43	N/C	44	N/C
45	N/C	46	N/C
47	N/C	48	1.5 V
49	N/C	50	GND
51	N/C	52	VCC3

Table 3-12: Full-size PCIe Mini Card Slot Pinouts

3.2.11 PCIe Mini Card Slot (Half-size)

CN Label: CN4

CN Type: Half-size PCIe Mini card slot

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

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

The PCIe Mini card slot is for installing half-size PCIe Mini expansion cards.

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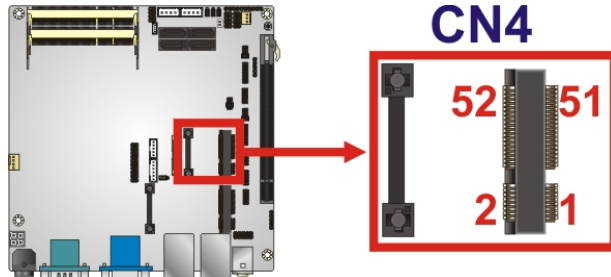


Figure 3-12: Half-size PCIe Mini Card Slot Connector Location

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	PCIE_WAKE#	2	VCC3
3	N/C	4	GND
5	N/C	6	1.5 V
7	N/C	8	N/C
9	GND	10	N/C
11	CLK-	12	N/C
13	CLK+	14	N/C
15	GND	16	N/C
17	PCIRST#	18	GND
19	N/C	20	VCC3
21	GND	22	PCIRST#
23	PERN2	24	3VDual
25	PERP2	26	GND
27	GND	28	1.5 V
29	GND	30	SMBCLK
31	PETN2	32	SMBDATA
33	PETP2	34	GND
35	GND	36	USBD-
37	N/C	38	USBD+
39	N/C	40	GND
41	N/C	42	N/C
43	N/C	44	N/C
45	N/C	46	N/C
47	N/C	48	1.5 V
49	N/C	50	GND

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
51	N/C	52	VCC3

Table 3-13: Half-size PCIe Mini Card Slot Pinouts

3.2.12 Power Supply Connector

- CN Label:** PWR2
- CN Type:** 4-pin connector
- CN Location:** See Figure 3-13
- CN Pinouts:** See Table 3-14

The Power Supply connector provides +12 V power output.

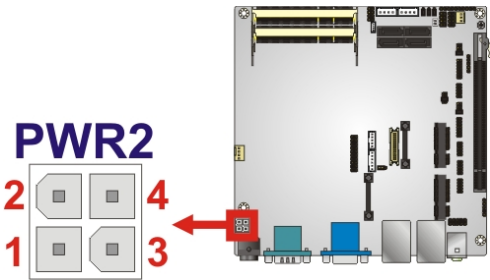


Figure 3-13: +12V Power Supply Connector Location

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	GND
3	+ 12V	4	+ 12V

Table 3-14: +12V Power Supply Connector Pinouts

3.2.13 RS-232/422/485 Serial Port Connector

- CN Label:** COM4, COM6
- CN Type:** 14-pin header
- CN Location:** See Figure 3-14
- CN Pinouts:** See Table 3-15

This connector provides RS-232, RS-422, or RS-485 communications.

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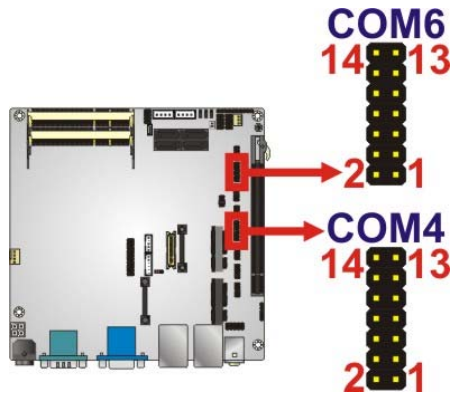


Figure 3-14: RS-232/422/485 Serial Port Location

PIN NO.	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 (GND)
10	GND (GND)
11	TXD422+/TXD485+
12	TXD422-/TXD485-
13	RXD422+
14	RXD422-

Table 3-15: RS-232/422/485 Serial Port Connector Pinouts

3.2.14 RS-232 Serial Port Connector

CN Label: COM2, COM3, COM5

CN Type: 10-pin header

CN Location: See Figure 3-15

CN Pinouts: See Table 3-16

The connector supports three internal high speed UARTs.

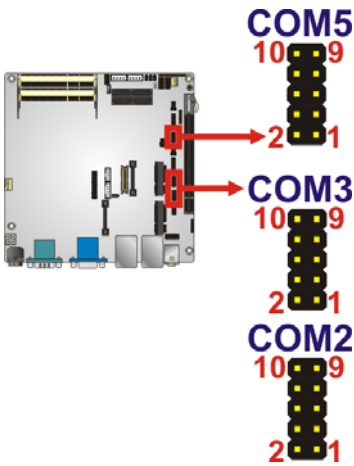


Figure 3-15: RS-232 Serial Port Connector Location

PIN NO	DESCRIPTION
1	DCD
2	DSR
3	SIN
4	RTS
5	SOUT
6	CTS
7	DTR
8	XRI
9	GND
10	GND

Table 3-16: RS-232 Serial Port Connector Pinouts

3.2.15 SATA Drive Connectors

- CN Label:

S_ATA1, S_ATA2, S_ATA5, S_ATA6
- CN Type:

7-pin SATA drive connectors
- CN Location:

See Figure 3-16
- CN Pinouts:

See Table 3-17

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The four SATA 3Gb/s drive connectors are each connected to a SATA 3Gb/s drive. The SATA 3Gb/s drives transfer data at speeds as high as 3.0 Gb/s.

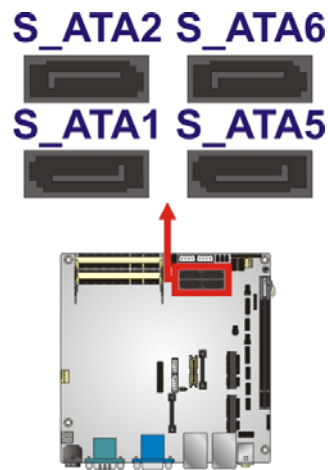


Figure 3-16: SATA Drive Connector Locations

PIN NO.	DESCRIPTION
1	GND
2	TX +
3	TX -
4	GND
5	RX -
6	RX +
7	GND

Table 3-17: SATA Drive Connector Pinouts

3.2.16 SATA Power Connectors

CN Label:	CN5, CN6
CN Type:	4-pin wafer
CN Location:	See Figure 3-17
CN Pinouts:	See Table 3-18

The SATA Power Connectors provides +5V power output on Pin 1 and +12V power output on Pin 4 to the SATA connectors.

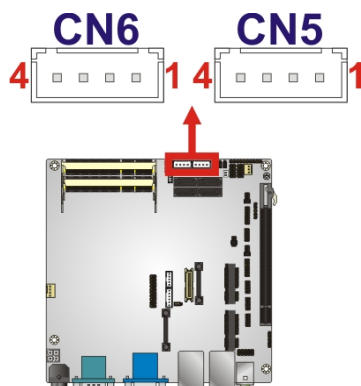


Figure 3-17: SATA Power Connector Locations

PIN NO.	DESCRIPTION
1	+5V (Supports 1A)
2	GND
3	GND
4	+12V (Supports 1A)

Table 3-18: SATA Power Connector Pinouts

3.2.17 SMBus Connector

CN Label:	CN7
CN Type:	4-pin wafer
CN Location:	See Figure 3-18
CN Pinouts:	See Table 3-19

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

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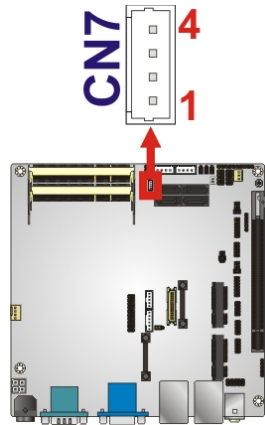


Figure 3-18: SMBus Connector Pinout Locations

PIN NO.	DESCRIPTION
1	GND
2	SDAT
3	SCLK
4	+5V

Table 3-19: SMBus Connector Pinouts

3.2.18 SPDIF Connector

CN Label:	SPDIF1
CN Type:	5-pin connector
CN Location:	See Figure 3-19
CN Pinouts:	See Table 3-20

This connector is used to connect digital audio devices to the system.

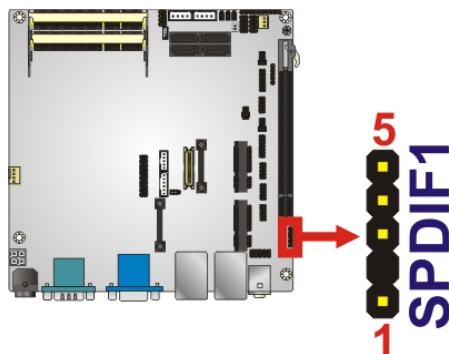


Figure 3-19: SPDIF Connector Pinout Locations

PIN NO.	DESCRIPTION
1	5V
2	NC
3	SPDIFOUT
4	GND
5	SPDIFIN

Table 3-20: SPDIF Connector Pinouts

3.2.19 SPI Flash Connector

CN Label:	JSPI1
CN Type:	8-pin header
CN Location:	See Figure 3-20
CN Pinouts:	See Table 3-21

The 8-pin SPI Flash connector is used to flash the BIOS.

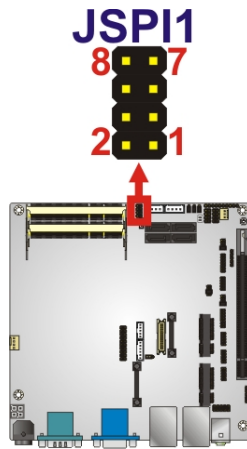


Figure 3-20: SPI Flash Connector Location

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	SPI VCC	2	GND
3	SPI CS#	4	SPI CLOCK
5	SPI SO	6	SPI SI
7	NC	8	NC

Table 3-21: SPI Flash Connector Pinouts

3.2.20 TPM Connector

CN Label:	TPM1
CN Type:	20-pin connector
CN Location:	See Figure 3-21
CN Pinouts:	See Table 3-22

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

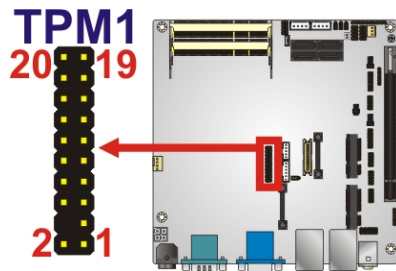


Figure 3-21: TPM1 Connector Location

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	LCLK	2	GND
3	LFRAME#	4	KEY
5	LRERST#	6	+5V
7	LAD3	8	LAD2
9	+3V	10	LAD1
11	LAD0	12	GND
13	SCL	14	SDA
15	SB3V	16	SERIRQ
17	GND	18	GLKRUN#
19	LPCPD#	20	LDRQ#

Table 3-22: TPM1 Connector Pinouts

3.2.21 USB Connectors

- CN Label:

USB1 and USB2
- CN Type:

8-pin header
- CN Location:

See Figure 3-22
- CN Pinouts:

See Table 3-23

The USB connectors connect to USB devices. Each pin header provides two USB ports.

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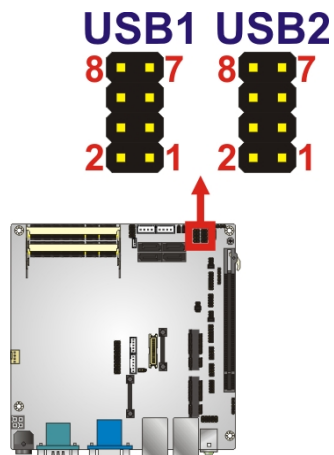


Figure 3-22: USB Connector Pinout Locations

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	VCC	2	GND
3	DATAN-	4	DATAM+
5	DATAN+	6	DATAM-
7	GND	8	VCC

Table 3-23: USB Connector Pinouts

3.3 External Peripheral Interface Connector Panel

Figure 3-23 shows the KINO-HM551 external peripheral interface connector (Mini-ITX SBC) panel. The KINO-HM551 Mini-ITX SBC panel consists of the following:

- 1 x 12 V adapter connector
- 1 x Audio connector
- 1 x DVI connector
- 2 x Ethernet connectors
- 1 x HDMI connectors
- 1 x RS-232 connector
- 4 x USB connectors
- 1 x VGA connector

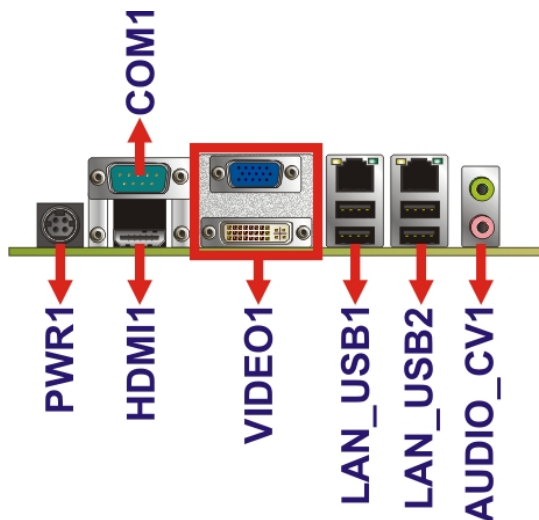


Figure 3-23: KINO-HM551 External Peripheral Interface Connector

3.3.1 Adapter Connector

CN Label: PWR1
CN Type: DC-IN
CN Location: See Figure 3-24
CN Pinouts: See Table 3-24

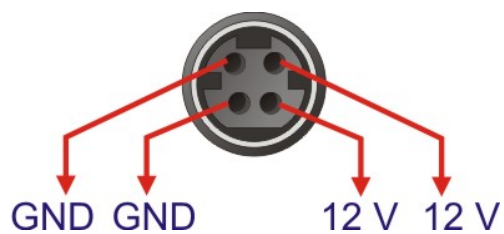


Figure 3-24: 4-pin Power Mini-DIN Connection

PIN NO.	DESCRIPTION
1	12V
2	GND
3	12V
4	GND
5	GND

Table 3-24: Adapter Connector Pinouts

KINO-HM551**3.3.2 Audio Connector**

CN Label:	AUDIO_CV1
CN Type:	Audio jack
CN Pinouts:	See Figure 3-25

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 3-25: Audio Connector

3.3.3 Ethernet/USB Connector

CN Label:	LAN1_USB1 and LAN2_USB2
CN Type:	RJ-45 and USB port
CN Location:	See Figure 3-26
CN Pinouts:	See Table 3-25 and Table 3-26

The KINO-HM551 is equipped with two built-in RJ-45 Ethernet controllers. Each controller can connect to the LAN through one RJ-45 LAN connector.

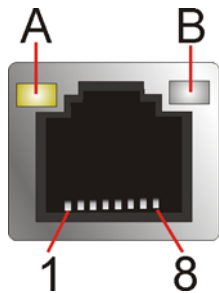


Figure 3-26: Ethernet Connector

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
P1	VCC	P6	LAN_MDIP2
P2	LAN_MDIPO	P7	LAN_MDIN2
P3	LAN_MDINO	P8	LAN_MDIP3
P4	LAN_MDIP1	P9	LAN_MDIN3
P5	LAN_MDIN1	P10	GND

Table 3-25: LAN Connector Pinouts

PIN NO.	DESCRIPTION
1	VCC
2	DATA-
3	DATA+
4	GND

Table 3-26: USB Connector Pinouts

3.3.4 HDMI Connector

- CN Label:

HDMI1
- CN Type:

HDMI type A connector
- CN Pinouts:

See Table 3-27

The HDMI (High-Definition Multimedia Interface) connector connects to digital audio or video sources.

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	HDMI_DATA2	13	N/C

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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 3-27: HDMI Connector Pinouts**3.3.5 Serial Port DB-9 Connector**

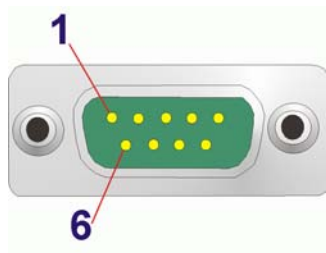
CN Label: COM1

CN Type: DB-9 Male

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

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

The KINO-HM551 offers one external high speed UART port for a DB-9 female cable.

**Figure 3-27: Serial Port DB-9 Male Connector**

PIN NO.	DESCRIPTION
1	DATA CARRIER DETECT (DCD1)
2	RECEIVE DATA (RXD1)

PIN NO.	DESCRIPTION
3	TRANSMIT DATA (TXD1)
4	DATA TERMINAL READY (DTR1)
5	GND (GND1)
6	DATA SET READY (DSR1)
7	REQUEST TO SEND (RTS1)
8	CLEAR TO SEND (CTS1)
9	RING INDICATOR (RI1)

Table 3-28: USB Connector Pinouts

3.3.6 VGA and DVI Connector

CN Label: VIDEO1

CN Type: 15-pin Female (VGA) , 24-pin Female (DVI)

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

CN Pinouts: **Table 3-29** and **Table 3-30**

This port connects to a monitor that accepts a standard VGA input.

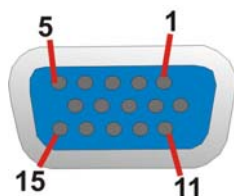


Figure 3-28: VGA Connector

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	RED	2	GREEN
3	BLUE	4	NC
5	GND	6	GND
7	GND	8	GND
9	VCC	10	GND
11	NC	12	DDCDAT
13	HSYNC	14	VSYNC

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PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
15	DDCCLK		

Table 3-29: VGA Connector Pinouts

The DVI (Digital Visual Interface) port connects to a monitor that supports DVI video input.

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	DVI signal differential pair (2-)	2	DVI signal differential pair (2+)
3	GND	4	DVI signal differential pair (4-)
5	DVI signal differential pair (4+)	6	DDCCLK
7	DDCDATA	8	N/C
9	DVI signal differential pair (1-)	10	DVI signal differential pair (1+)
11	GND	12	DVI signal differential pair (3-)
13	DVI signal differential pair (3+)	14	5V supply
15	GND	16	Hot plug detect
17	DVI signal differential pair (0-)	18	DVI signal differential pair (0+)
19	GND	20	DVI signal differential pair (5-)
21	DVI signal differential pair (5+)	22	GND
23	DVI CLK(+)	24	DVI CLK(-)

Table 3-30: DVI Connector Pinouts

Chapter

4

Installation

KINO-HM551

4.1 Anti-static Precautions

**WARNING:**

Failure to take ESD precautions during the installation of the KINO-HM551 may result in permanent damage to the KINO-HM551 and severe injury to the user.

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the KINO-HM551. Dry climates are especially susceptible to ESD. It is therefore critical that whenever the KINO-HM551 or any other electrical component is handled, the following anti-static precautions are strictly adhered to.

- ***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-HM551, place it on an anti-static pad. This reduces the possibility of ESD damaging the KINO-HM551.
- ***Only handle the edges of the PCB:*** When handling the PCB, hold the PCB by the edges.

4.2 Installation Considerations



NOTE:

The following installation notices and installation considerations should be read and understood before the KINO-HM551 is installed. All installation notices pertaining to the installation of the KINO-HM551 should be strictly adhered to. Failing to adhere to these precautions may lead to severe damage of the KINO-HM551 and injury to the person installing the motherboard.

4.2.1 Installation Notices



WARNING:

The installation instructions described in this manual should be carefully followed in order to prevent damage to the KINO-HM551, KINO-HM551 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 KINO-HM551 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 the KINO-HM551 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 to the KINO-HM551 off:

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- When working with the KINO-HM551, make sure that it is disconnected from all power supplies and that no electricity is being fed into the system.

Before and during the installation of the KINO-HM551 **DO NOT:**

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

4.3 Unpacking

When the KINO-HM551 is unpacked, please check all the unpacking list items listed in Chapter 3 are indeed present. If any of the unpacking list items are not available please contact the KINO-HM551 vendor reseller/vendor where the KINO-HM551 was purchased or contact an IEI sales representative.

4.4 CPU, CPU Cooling Kit and SO-DIMM Installation



WARNING:

A CPU should never be turned on without the specified cooling kit being installed. If the cooling kit (heat sink and fan) is not properly installed and the system turned on, permanent damage to the CPU, KINO-HM551 and other electronic components attached to the system may be incurred. Running a CPU without a cooling kit may also result in injury to the user.

The CPU, CPU cooling kit and DIMM are the most critical components of the KINO-HM551. If one of these component is not installed the KINO-HM551 cannot run.

4.4.1 Socket G1 CPU Installation

**WARNING:**

CPUs are expensive and sensitive components. When installing the CPU please be careful not to damage it in anyway. Make sure the CPU is installed properly and ensure the correct cooling kit is properly installed.

To install a socket G1 CPU onto the KINO-HM551, follow the steps below:

**WARNING:**

When handling the CPU, only hold it on the sides. DO NOT touch the pins at the bottom of the CPU.

Step 1: Unlock the CPU retention screw. When shipped, the retention screw of the CPU socket should be in the unlocked position. If it is not in the unlocked position, use a screwdriver to unlock the screw. See **Figure 4-1**.

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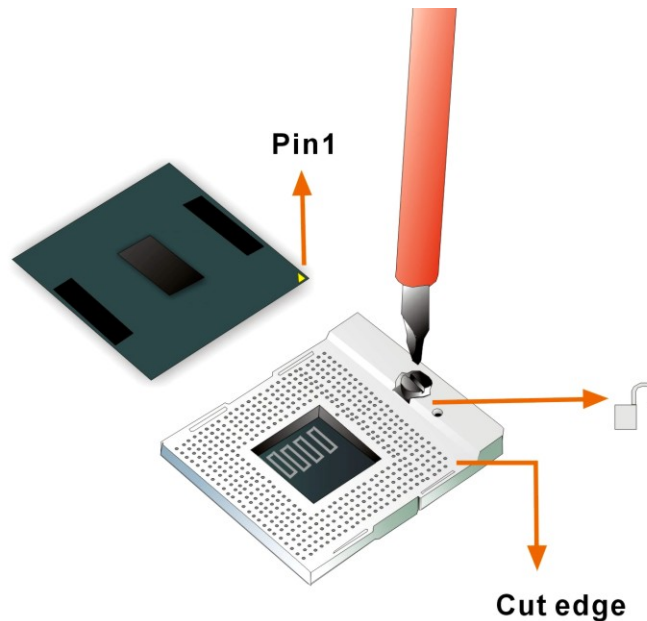


Figure 4-1: Make sure the CPU socket retention screw is unlocked

- Step 2: Inspect the CPU socket.** Make sure there are no bent pins and make sure the socket contacts are free of foreign material. If any debris is found, remove it with compressed air.
- Step 3: Correctly Orientate the CPU.** Make sure the IHS (integrated heat sink) side is facing upwards.
- Step 4: Correctly position the CPU.** Match the Pin 1 mark with the cut edge on the CPU socket. See **Figure 4-1**.
- Step 5: Align the CPU pins.** Carefully align the CPU pins with the holes in the CPU socket.
- Step 6: Insert the CPU.** Gently insert the CPU into the socket. If the CPU pins are properly aligned, the CPU should slide into the CPU socket smoothly.
- Step 7: Lock the retention screw.** Rotate the retention screw into the locked position. See **Figure 4-2**.

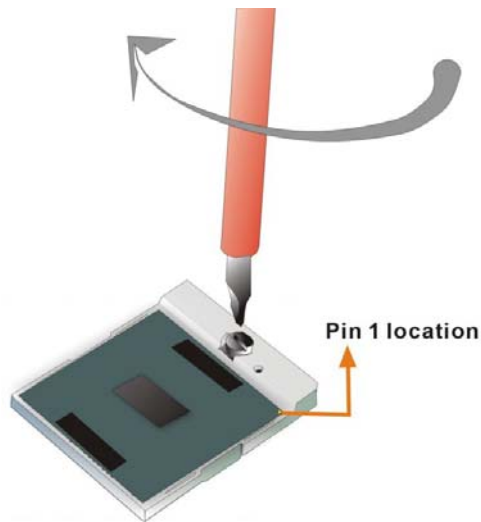


Figure 4-2: Lock the CPU Socket Retention Screw

4.4.2 Socket G1 Cooling Kit Installation

An IEI Socket G1 CPU cooling kit can be purchased separately. (See **Chapter 3**) The cooling kit comprises 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 cooling kit bracket. A cooling kit bracket is installed on the rear of the motherboard. Align the bracket with the four retention holes at the back of the motherboard. Once properly aligned, insert four retention screws from the front of the motherboard.

KINO-HM551

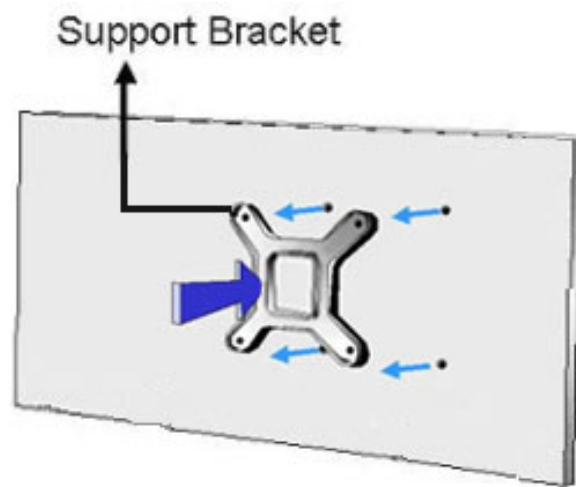


Figure 4-3: Cooling Kit Support Bracket

- Step 2:** **Open the lever at the top of the heat sink.** Lift the lever at the top of the cooling kit to loosen the cooling kit clamps.
- Step 3:** **Secure the cooling kit.** Gently place the heat sink and cooling kit onto the CPU. Make sure the hooks are properly secured to the bracket. To secure the cooling kit, close the top lever.
- Step 4:** **Connect the fan cable.** Connect the cooling kit fan cable to the fan connector on the KINO-HM551. Carefully route the cable and avoid heat generating chips and fan blades.

4.4.3 SO-DIMM Installation

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

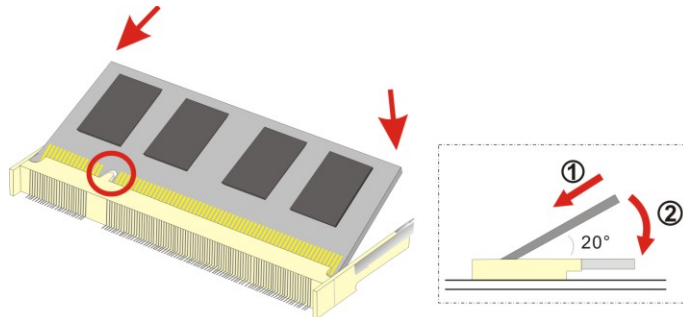


Figure 4-4: SO-DIMM Installation

- Step 1:** Locate the **SO-DIMM socket**. Place the board on an anti-static mat.
- Step 2:** Align the **SO-DIMM with the socket**. Align the notch on the memory with the notch on the memory socket.
- Step 3:** Insert the **SO-DIMM**. Push the memory in at a 20° angle. (See **Figure 4-4**)
- Step 4:** **Seat the SO-DIMM**. Gently push downwards and the arms clip into place. (See **Figure 4-4**)

4.5 Jumper Settings



NOTE:

A jumper is a metal bridge used to close an electrical circuit. It consists of two or three 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.

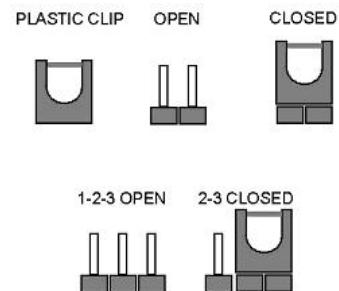


Figure 4-5: Jumper Locations

KINO-HM551

Before the KINO-HM551 is installed in the system, the jumpers must be set in accordance with the desired configuration. The jumpers on the KINO-HM551 are listed in **Table 4-1**.

Description	Type	Label
AT/ATX power select	3-pin header	J_ATXCTL1
Clear CMOS	3-pin header	J_CMOS1
ME RTC Register	3-pin header	ME_RTC1
LVDS voltage selection	3-pin header	J_VLVDS1
LVDS panel resolution selection	8-pin header	J_PID1
Serial Port Mode setting	8-pin header	JP2, JP3

Table 4-1: Jumpers

4.5.1 AT/ATX Power Select Jumper Settings

Jumper Label:	J_ATXCTL1
Jumper Type:	3-pin header
Jumper Settings:	See Table 4-2
Jumper Location:	See Figure 4-6

The AT/ATX Power Select jumper specifies the systems power mode as AT or ATX. AT/ATX Power Select jumper settings are shown in **Table 4-2**.

AT Power Select	Description	
Short 1 - 2	Use ATX power	Default
Short 2 - 3	Use AT power	

Table 4-2: AT/ATX Power Select Jumper Settings

The location of the AT/ATX Power Select jumper is shown in **Figure 4-6** below.

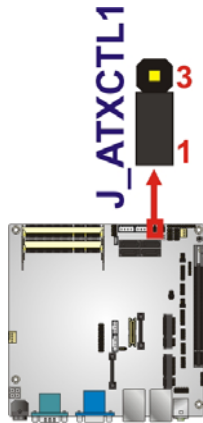


Figure 4-6: AT/ATX Power Select Jumper Location

4.5.2 Clear CMOS Jumper

Jumper Label:	J_CMOS1
Jumper Type:	3-pin header
Jumper Settings:	See Table 4-3
Jumper Location:	See Figure 4-7

If the KINO-HM551 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, 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**.

KINO-HM551

Clear CMOS	Description	
Short 1-2	Keep CMOS Setup	Default
Short 2-3	Clear CMOS Setup	

Table 4-3: Clear CMOS Jumper Settings

The location of the clear CMOS jumper is shown in **Figure 4-5**

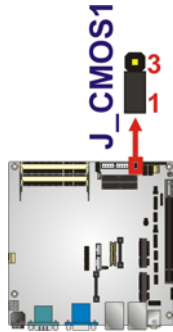


Figure 4-7: AT Auto Button Select Jumper Settings

4.5.3 ME RTC Register Jumper

Jumper Label:	ME_RTC1
Jumper Type:	3-pin header
Jumper Settings:	See Table 4-4
Jumper Location:	See Figure 4-8

The ME RTC Register jumper saves or clears the ME RTC registers. The ME RTC Register jumper settings are shown in **Table 4-4**.

Setting	Description	
Short 1 - 2	Save ME RTC registers	Default
Short 2 – 3	Clear ME RTC registers	

Table 4-4: ME RTC Register Jumper Settings

The location of the ME RTC Register jumper is shown in **Figure 4-8** below.

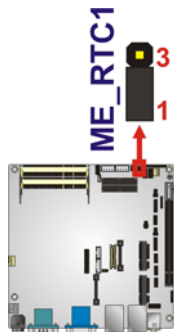


Figure 4-8: ME RTC Register Jumper Location

4.5.4 LVDS Voltage Selection



WARNING:

Incorrect voltages can destroy the LCD panel. Make sure to select a voltage that matches the voltage required by the LCD panel.

Jumper Label:	J_VLVDS1
Jumper Type:	3-pin header
Jumper Settings:	See Table 4-5
Jumper Location:	See Figure 4-9

The LCD voltage selection jumper sets the voltage of the power supplied to the LCD panel.

Setting	Description
Short 1-2	Set The Voltage Level Of Panel To VCC3
Short 3-4	Set The Voltage Level Of Panel To VCC

Table 4-5: LVDS Voltage Selection Jumper Settings

KINO-HM551

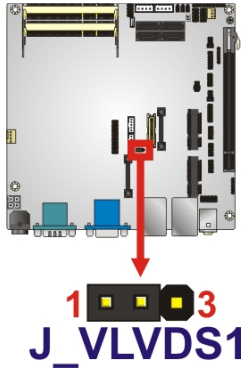


Figure 4-9: LVDS Voltage Selection Jumper Locations

4.5.5 LVDS Screen Resolution Selection

Jumper Label:	J_PID1
Jumper Type:	8-pin header
Jumper Settings:	See Table 4-6
Jumper Location:	See Figure 4-10

The LVDS Screen Resolution Selection jumper allows the LVDS screen voltage to be set. The LVDS Screen Resolution Selection jumper settings are shown in **Table 4-2**.

Setting	Description	
Open	800 X 600 (18bit)	
Short 1-2	1024 X 768 (18bit)	
Short 3-4	1024 X 768 (24bit)	Default
Short 1-2, 3-4	1280 X 800 (18bit)	
Short 5-6	1280 X 1024 (48bit)	
Short 1-2, 5-6	1366 X 768 (18bit)	
Short 3-4, 5-6	1400 X 1050 (48bit)	
Short 1-2, 2-4, 5-6	1440X 900 (48bit)	
Short 7-8	1600 X 900 (48bit)	
Short 1-2, 7-8	1600 X 1200 (48bit)	
Short 3-4, 7-8	1680X 1050 (48bit)	
Short 1-2, 3-4, 7-8	1920 X 1080 (48bit)	
Short 5-6, 7-8	1920 X 1200 (48bit)	

Setting	Description	
Short 1-2, 5-6, 7-8	2048 X 1536 (48bit)	

Table 4-6: LVDS Screen Resolution Jumper Settings

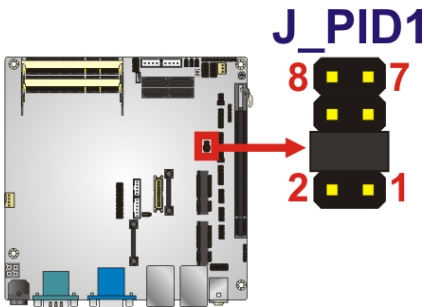


Figure 4-10: LVDS Panel Resolution Jumper Pinout Locations

4.5.6 Serial Port Select Jumper

- Jumper Label:

JP2, JP3
- Jumper Type:

8-pin header
- Jumper Settings:

See Table 4-7
- Jumper Location:

See Figure 4-11

This jumper sets the communication protocol of the serial port.

Setting	Description	
Short 1-2	RS-232	Default
Short 3-4	RS-422	
Short 5-6	RS-485	
Short 7-8	RS-485 with RTS Control	

Table 4-7: Serial Port Jumper Settings

KINO-HM551

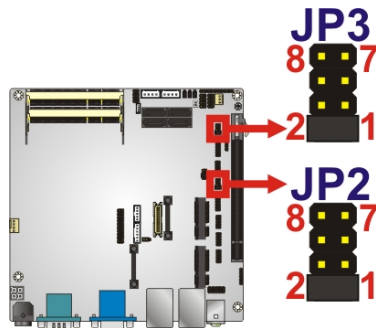


Figure 4-11: Serial Port Jumper Location

4.6 Chassis Installation

4.6.1 Airflow

**WARNING:**

Airflow is critical to the cooling of the CPU and other onboard components. The chassis in which the KINO-HM551 must have air vents to allow cool air to move into the system and hot air to move out.

The KINO-HM551 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-HM551 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 Dual RS-232 Cable with Slot Bracket

The dual RS-232 cable slot connector consists of two connectors attached to two independent cables. Each cable is then attached to a D-sub 9 male connector that is mounted onto a slot. To install the dual RS-232 cable, please follow the steps below.

Step 1: Locate the connectors. The locations of the RS-232 connectors are shown in Chapter 3.

Step 2: Insert the cable connectors. Insert one connector into each serial port box headers. See Figure 4-12. A key on the front of the cable connectors ensures the connector can only be installed in one direction.

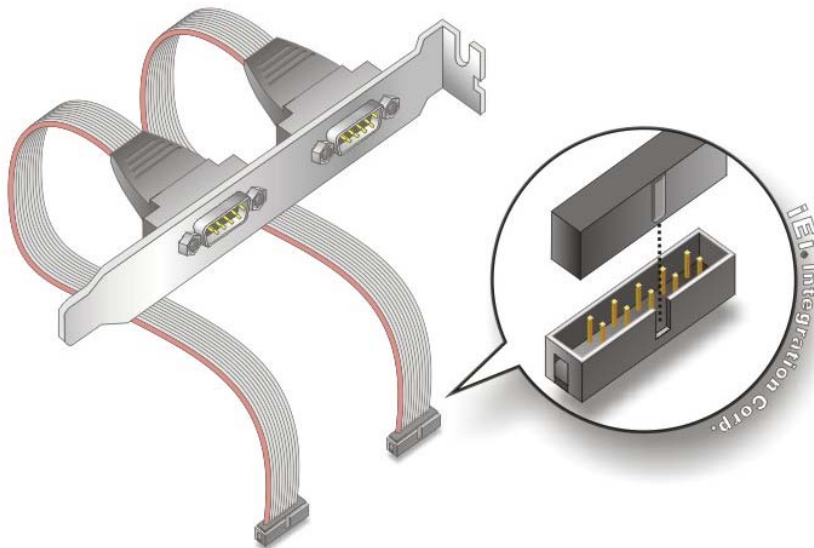


Figure 4-12: Dual RS-232 Cable Installation

Step 3: Secure the bracket. The dual RS-232 connector has two D-sub 9 male connectors secured on a bracket. To secure the bracket to the chassis please refer to the reference material that came with the chassis.

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4.7.2 SATA Drive Connection

The KINO-HM551 is shipped with two SATA drive cables. To connect the SATA drive to the connector, please follow the steps below.

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

Step 2: Insert the **cable connector**. Insert the cable connector into the on-board SATA drive connector and the SATA power connector. See **Figure 4-13**.

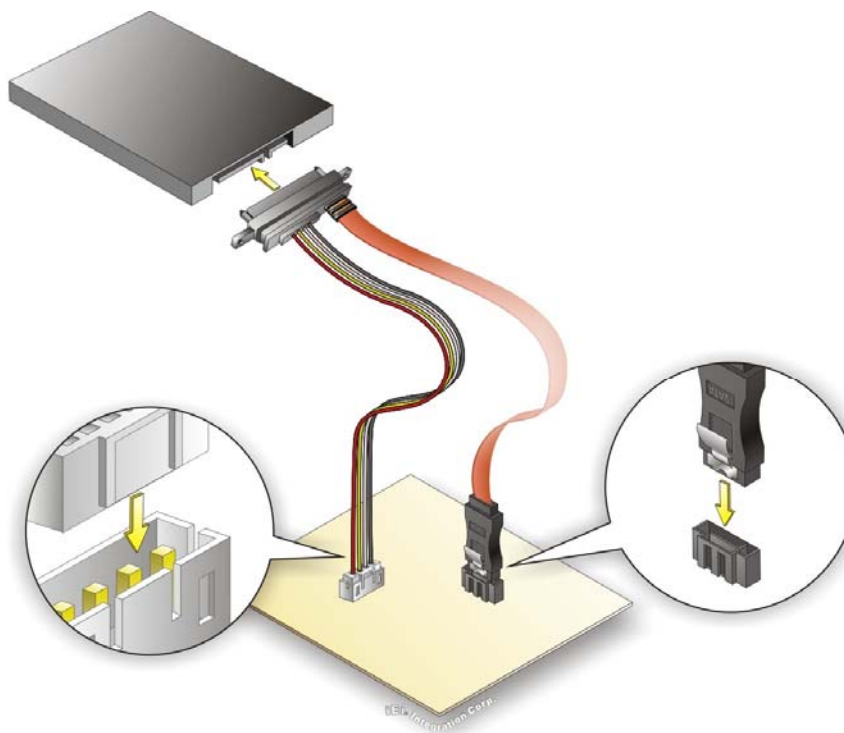


Figure 4-13: SATA Drive Cable Connection

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 4-13**.

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

4.8 External Peripheral Interface Connection

The following external peripheral devices can be connected to the external peripheral interface connectors.

- Audio devices
- HDMI devices
- RJ-45 Ethernet cable connector
- USB devices
- Serial port devices
- VGA monitor
- DVI devices

To install these devices, connect the corresponding cable connector from the actual device to the corresponding KINO-HM551 external peripheral interface connector making sure the pins are properly aligned.

4.8.1 Audio Connector

The audio jacks on the external audio connector enable the KINO-HM551 to be connected to a stereo sound setup. To install the audio devices, follow the steps below.

Step 1: Identify the audio plugs. The plugs on your home theater system or speakers may not match the colors on the rear panel. If audio plugs are plugged into the wrong jacks, sound quality will be very bad.

Step 2: Plug the audio plugs into the audio jacks. Plug the audio plugs into the audio jacks. If the plugs on your speakers are different, an adapter will need to be used to plug them into the audio jacks.

- **Line Out port (Lime):** Connects to a headphone or a speaker.
- **Microphone (Pink):** Connects to a microphone.

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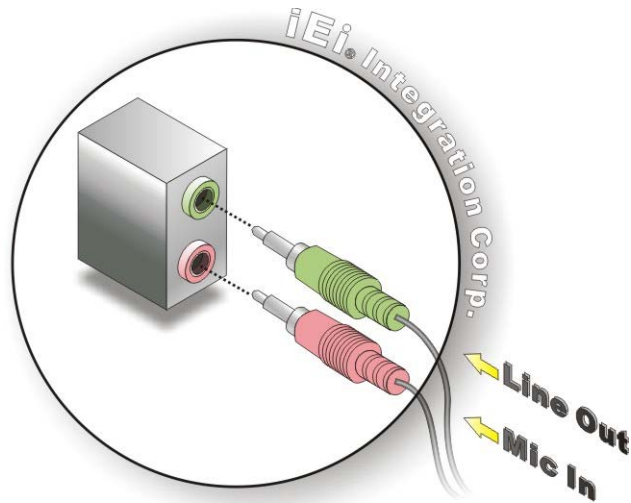


Figure 4-14: Audio Connector

Step 3: Check audio clarity. Check that the sound is coming through the right speakers by adjusting the balance front to rear and left to right.

4.8.2 HDMI Display Device Connection

The KINO-HM551 has one female HDMI connector on the external peripheral interface panel. The HDMI connectors are connected to digital display devices. To connect a digital display device to the KINO-HM551, please follow the instructions below.

Step 1: Locate the HDMI connector. The location of the HDMI connector is shown in another chapter.

Step 2: Align the HDMI connector. Align the male HDMI connector on the digital display device cable with the female HDMI connector on the external peripheral interface.

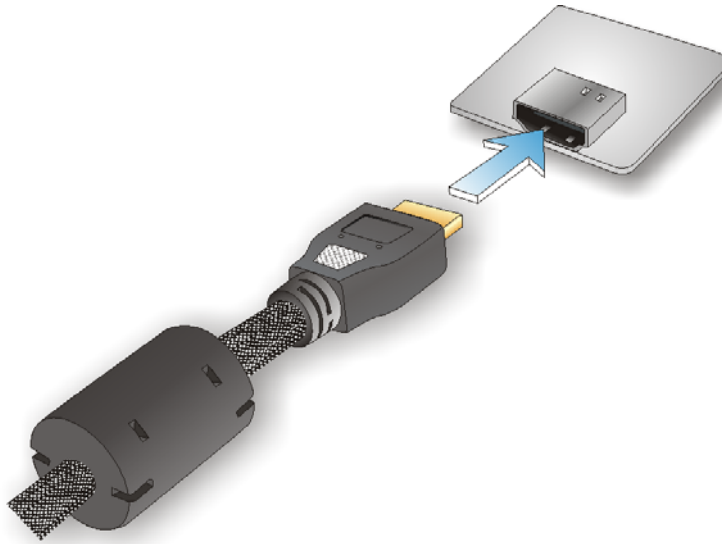


Figure 4-15: HDMI Connection

Step 3: Insert the HDMI connector Once the connectors are properly aligned with the male connector, insert the male connector from the digital display device into the female connector on the KINO-HM551.

Step 4: Secure the connector. Secure the HDMI connector from the digital display device to the external interface by tightening the two retention screws on either side of the connector.

4.8.3 LAN Connection

There are two external RJ-45 LAN connectors. The RJ-45 connector enables connection to an external network. To connect a LAN cable with an RJ-45 connector, please follow the instructions below.

Step 1: Locate the RJ-45 connectors. The location of the LAN connectors is shown in Chapter 3.

Step 2: Align the connectors. Align the RJ-45 connector on the LAN cable with one of the RJ-45 connectors on the KINO-HM551. See Figure 4-16.

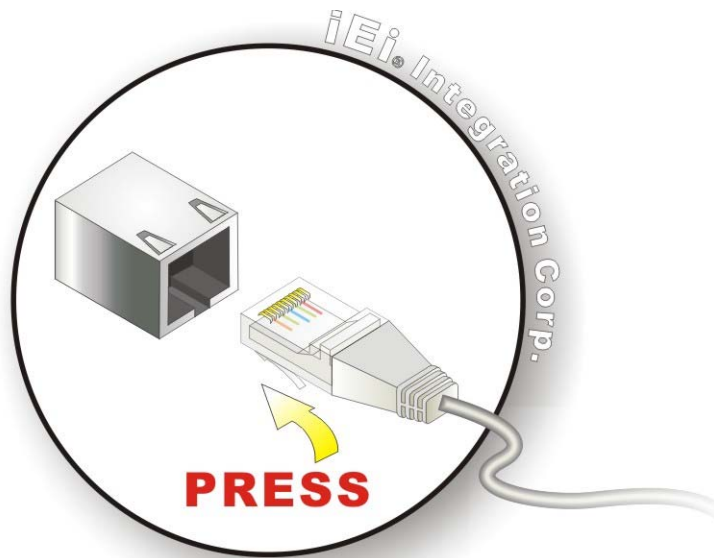


Figure 4-16: LAN Connection

Step 3: Insert the LAN cable RJ-45 connector. Once aligned, gently insert the LAN cable RJ-45 connector into the on-board RJ-45 connector.

4.8.4 USB Connection

The external USB Series "A" receptacle connectors provide easier and quicker access to external USB devices. Follow the steps below to connect USB devices to the KINO-HM551.

Step 1: Locate the USB Series "A" receptacle connectors. The location of the USB Series "A" receptacle connectors are shown in **Chapter 3**.

Step 2: Insert a USB Series "A" plug. Insert the USB Series "A" plug of a device into the USB Series "A" receptacle on the external peripheral interface. See Figure 4-17.

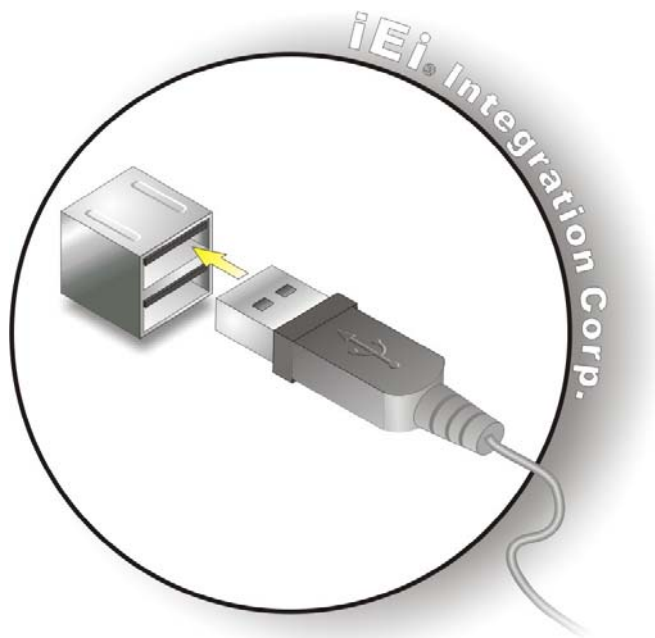


Figure 4-17: USB Connector

4.8.5 Serial Device Connection

The KINO-HM551 has a single female DB-9 connector on the external peripheral interface panel for a serial device. Follow the steps below to connect a serial device to the KINO-HM551.

Step 1: **Locate the DB-9 connector.** The location of the DB-9 connector is shown in Chapter 3.

Step 2: **Insert the serial connector.** Insert the DB-9 connector of a serial device into the DB-9 connector on the external peripheral interface. See Figure 4-18.

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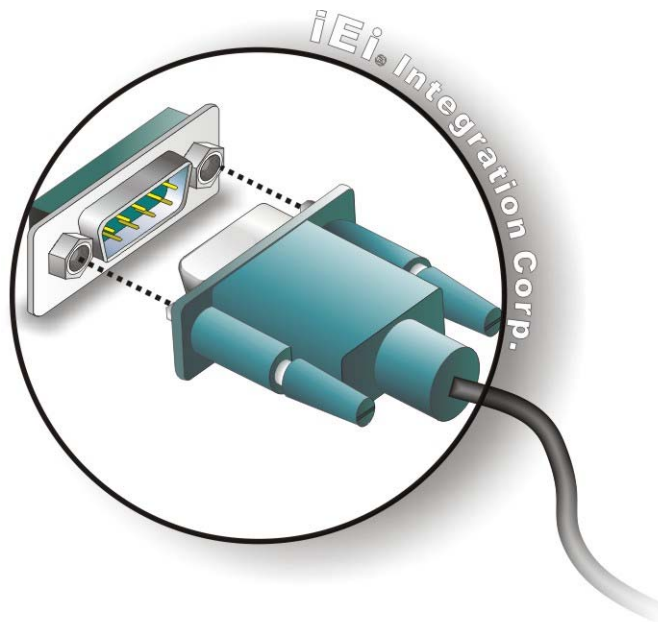


Figure 4-18: Serial Device Connector

Step 3: Secure the connector. Secure the serial device connector to the external interface by tightening the two retention screws on either side of the connector

4.8.6 VGA Monitor Connection

The KINO-HM551 has a single female DB-15 connector on the external peripheral interface panel. The DB-15 connector is connected to a CRT or VGA monitor. To connect a monitor to the KINO-HM551, please follow the instructions below.

- Step 1: Locate the female DB-15 connector.** The location of the female DB-15 connector is shown in **Chapter 3**.
- Step 2: Align the VGA connector.** Align the male DB-15 connector on the VGA screen cable with the female DB-15 connector on the external peripheral interface.
- Step 3: Insert the VGA connector** Once the connectors are properly aligned with the insert the male connector from the VGA screen into the female connector on the KINO-HM551. See Figure 4-19.

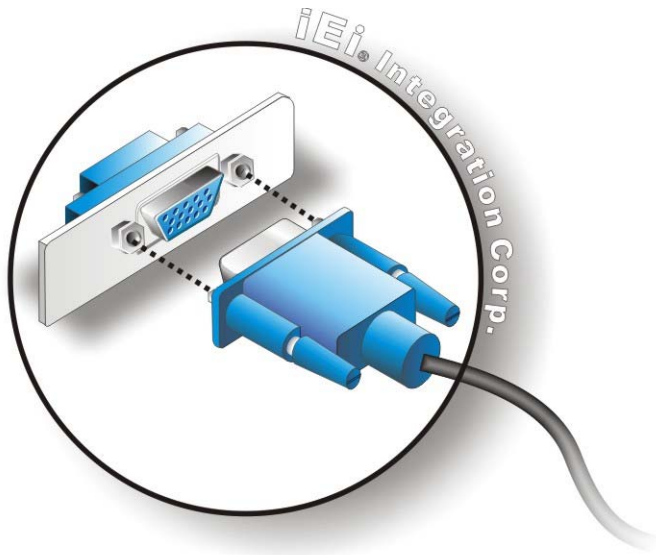


Figure 4-19: VGA Connector

Step 4: Secure the connector. Secure the DB-15 VGA connector from the VGA monitor to the external interface by tightening the two retention screws on either side of the connector.

4.8.7 DVI Display Device Connection

The KINO-HM551 has a single female DVI-D connector on the external peripheral interface panel. The DVI-D connector is connected to a digital display device. To connect a digital display device to the KINO-HM551, please follow the instructions below.

- Step 1: Locate the DVI-D connector.** The location of the DVI-D connector is shown in another chapter.
- Step 2: Align the DVI-D connector.** Align the male DVI-D connector on the digital display device cable with the female DVI-D connector on the external peripheral interface.
- Step 3: Insert the DVI-D connector** Once the connectors are properly aligned with the male connector, insert the male connector from the digital display device into the female connector on the KINO-HM551. See Figure 4-20.

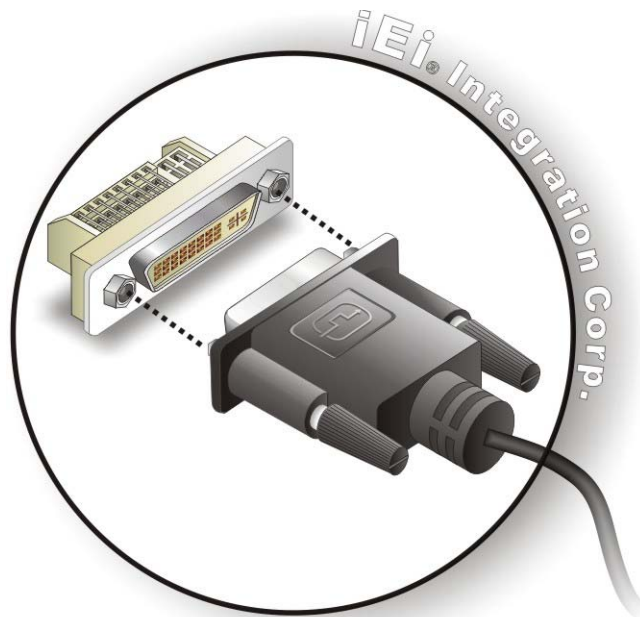


Figure 4-20: DVI Connector

Step 4: **Secure the connector.** Secure the DVI-D connector from the digital display device to the external interface by tightening the two retention screws on either side of the connector.

4.9 Software Installation

All the drivers for the KINO-HM551 are on the CD that came with the system. To install the drivers, please follow the steps below.

Step 1: 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 2: The driver main menu appears (**Figure 4-21**).

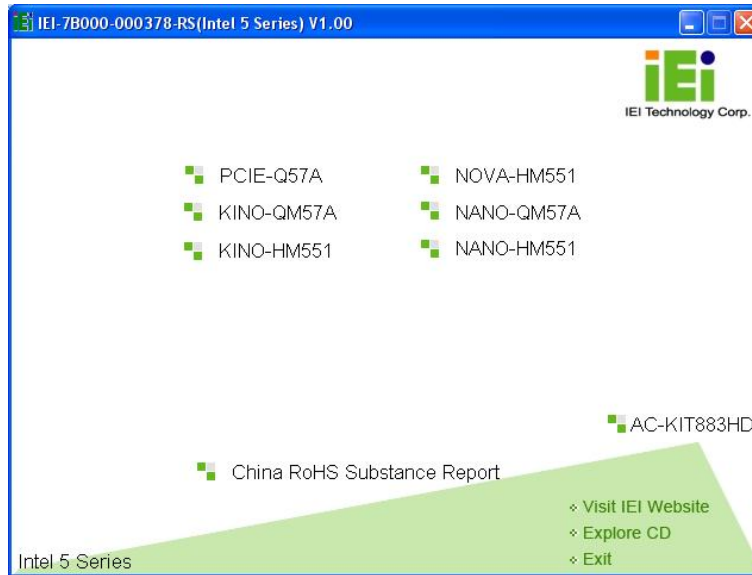


Figure 4-21: Introduction Screen

Step 3: Click **KINO-HM551**.

Step 4: A new screen with a list of available drivers appears (**Figure 4-22**).

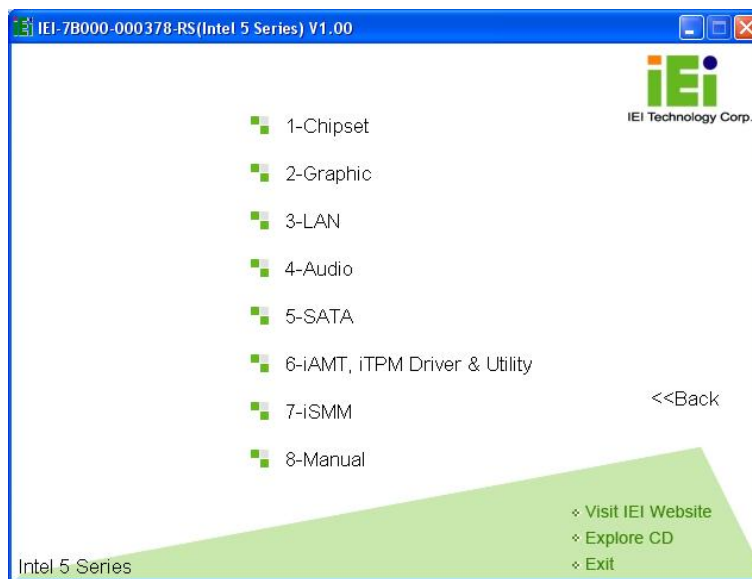


Figure 4-22: Available Drivers

Step 5: Install all of the necessary drivers in this menu.

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

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

If the message disappears before the **DELETE** 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 previous item
Down arrow	Move to next item
Left arrow	Move to the item on the left hand side
Right arrow	Move to the item on the right hand side

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Key	Function
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 all the CMOS changes
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

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.
- 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) 2010 American Megatrends, Inc.		
Main	Advanced	Chipset Boot Security Save & Exit
BIOS Information BIOS Vendor American Megatrends Core Version 4.6.3.7 0.16 Project Version B186AR10.ROM Build Date 08/31/2010 13:33:34 Memory Information Total Memory 2048 MB (DDR3 1333) System Date [Sun 01/30/2011] System Time [01:33:27] Access Level Administrator		Set the Date. Use Tab to switch between Data elements. ----- ←→: Select Screen ↑ ↓: Select Item EnterSelect +/-: Change Opt. F1 General Help F2 Previous Values F3 Optimized Defaults F4 Save & Exit ESC Exit
Version 2.02.1205. Copyright (C) 2010 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:** Date the current BIOS version was made

→ Memory Information

The **Memory Information** lists a brief summary of the on-board memory. The fields in **Memory Information** cannot be changed.

- **Total Memory:** Displays the auto-detected system memory size and type.

The System Overview field also has two user configurable fields:

KINO-HM551**→ 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]

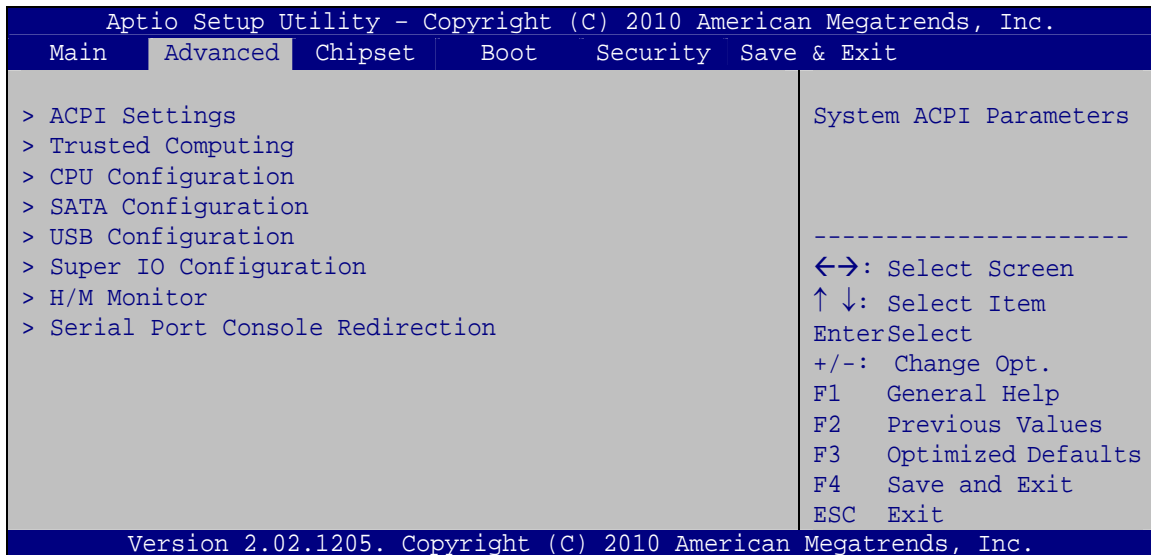
Use the **System Time** option to set the system time. Manually enter the hours, minutes and seconds.

5.3 Advanced

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

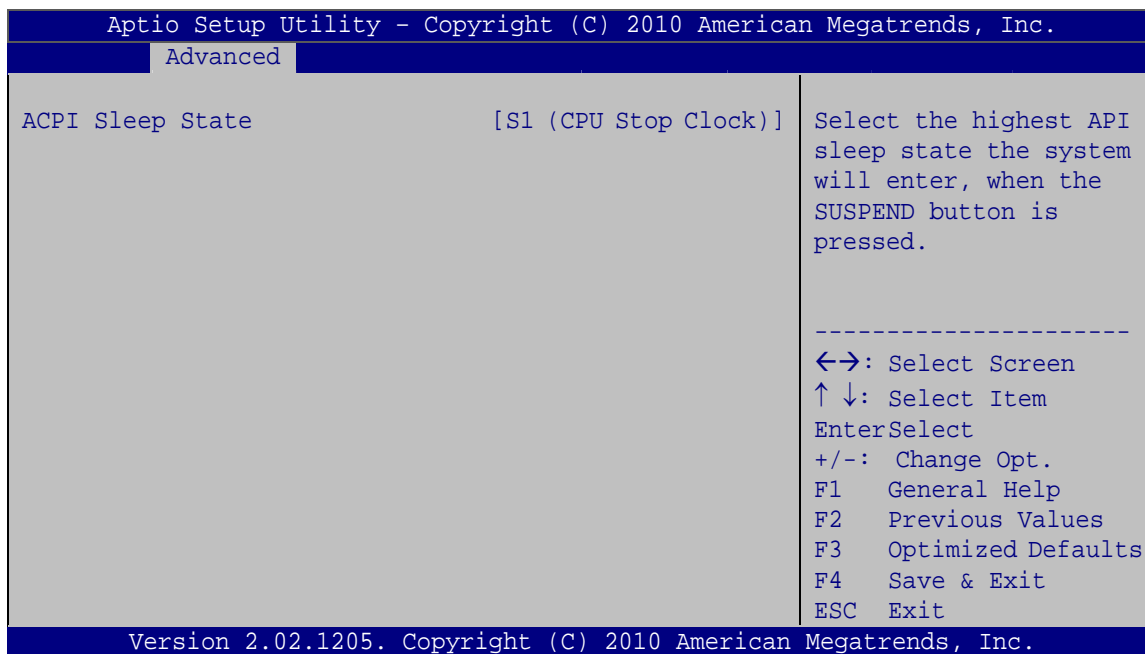
**WARNING!**

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)]

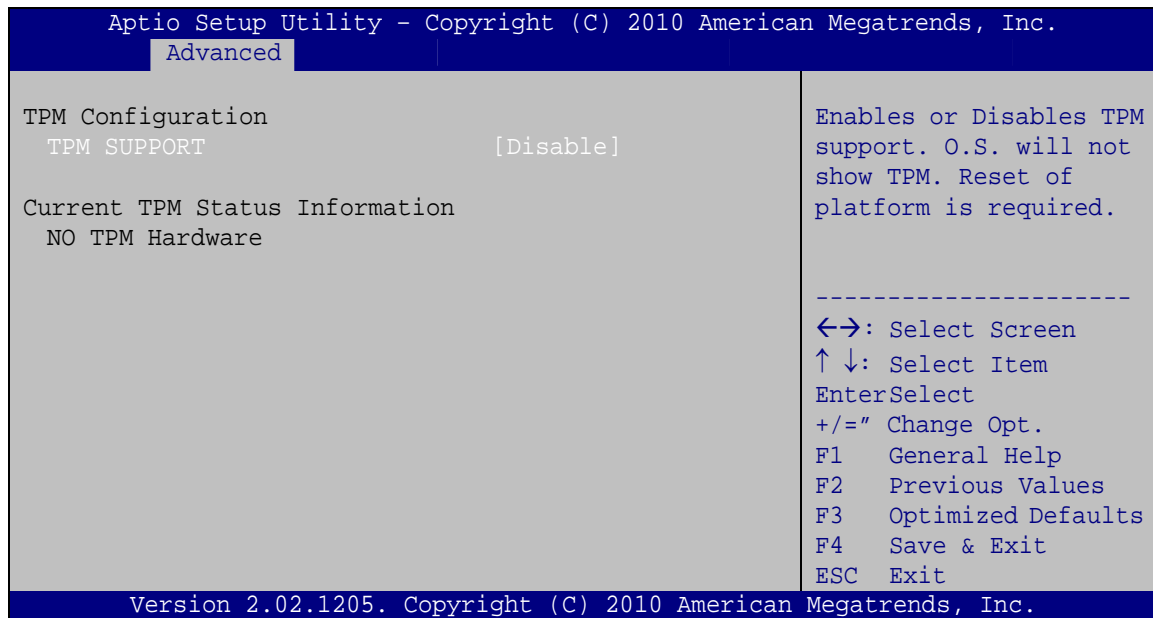
Use the **ACPI Sleep State** option to specify the sleep state the system enters when it is not being used.

- **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.

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5.3.2 Trusted Computing

Use the **Trusted Computing** menu (**BIOS Menu 4**) to configure settings related to the Trusted Computing Group (TCG) Trusted Platform Module (TPM).



BIOS Menu 4: TPM Configuration

➔ **TPM Support [Disable]**

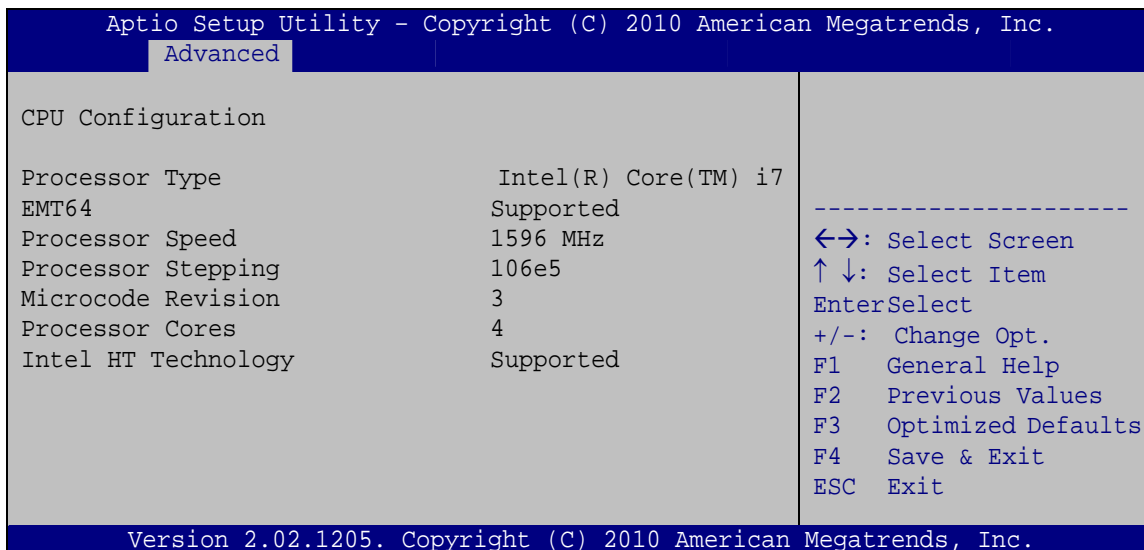
Use the **TPM Support** option to configure support for the TPM.

➔ **Disable** **DEFAULT** TPM support is disabled.

➔ **Enable** TPM support is enabled.

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

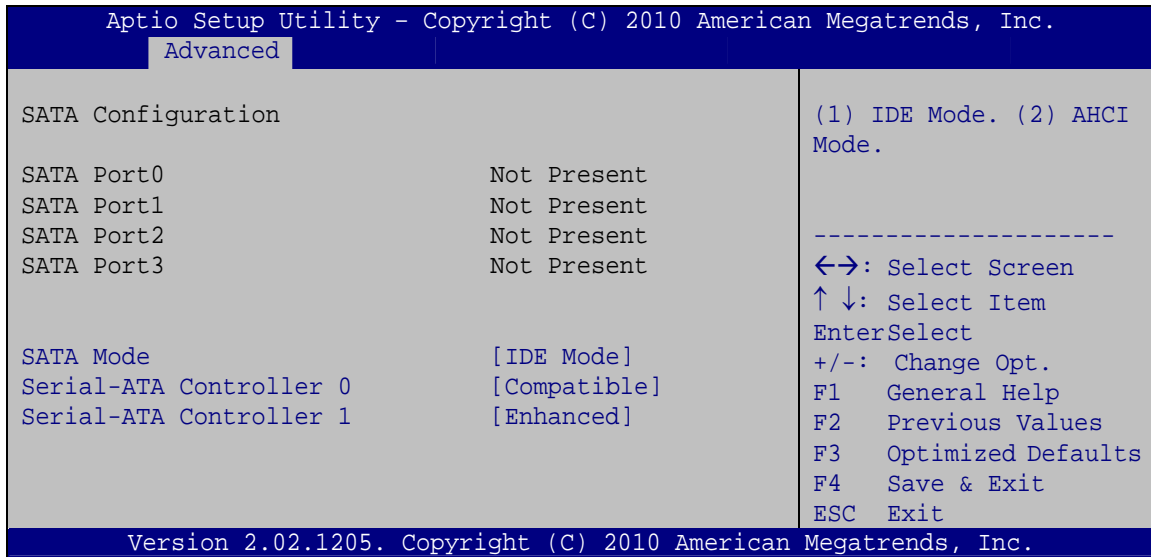
The CPU Configuration menu (**BIOS Menu 5**) lists the following CPU details:

- 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
- Processor Stepping: Lists the CPU processing stepping
- Microcode Revision: Lists the microcode revision
- Processor Cores: Lists the number of the processor core
- Intel HT Technology: Indicates if the Intel HT Technology is supported by the CPU.

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5.3.4 SATA Configuration

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

**BIOS Menu 6: IDE Configuration**→ **SATA Mode [IDE Mode]**

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

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

→ **Serial-ATA Controller 0/1 [Compatible]**

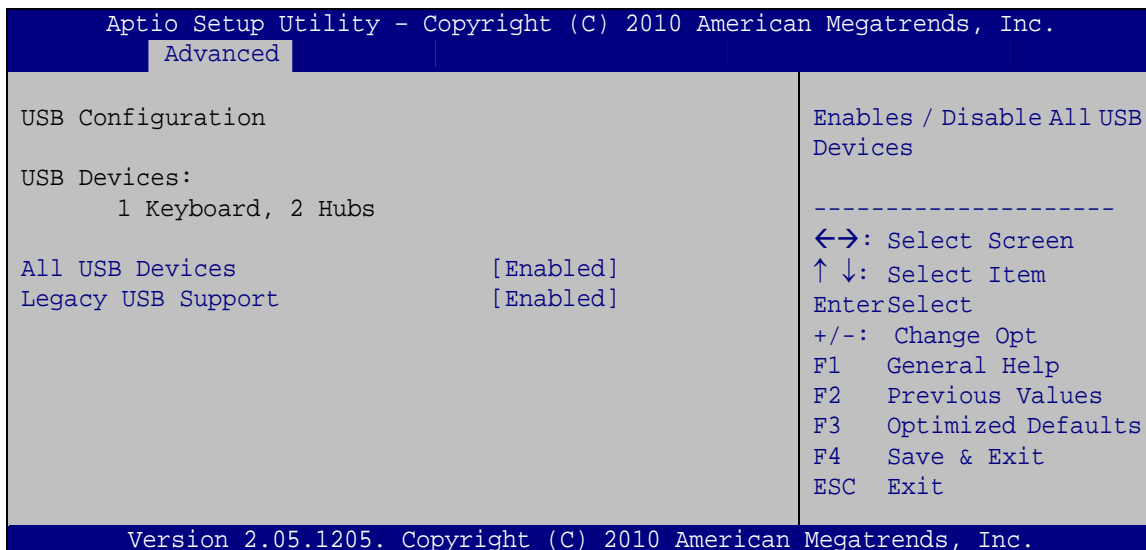
Use the **Serial-ATA Controller** option to configure the Serial-ATA controller mode when the SATA mode is set to IDE Mode.

- **Disable** Disables Serial-ATA controller.

- ➔ **Enhanced** Configures the Serial-ATA controller to be in enhanced mode. In this mode, IDE channels and SATA channels are separated. Some legacy OS do not support this mode.
- ➔ **Compatible** **DEFAULT** Configures the Serial-ATA controller to be in compatible mode. In this mode, a SATA channel will replace one of the IDE channels.

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

➔ **All USB Devices [Enabled]**

Use the **All USB Devices** option to enable the USB devices.

- ➔ **Disabled** All USB devices are disabled.

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➔ **Enabled** **DEFAULT** All USB devices are enabled.

➔ **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.

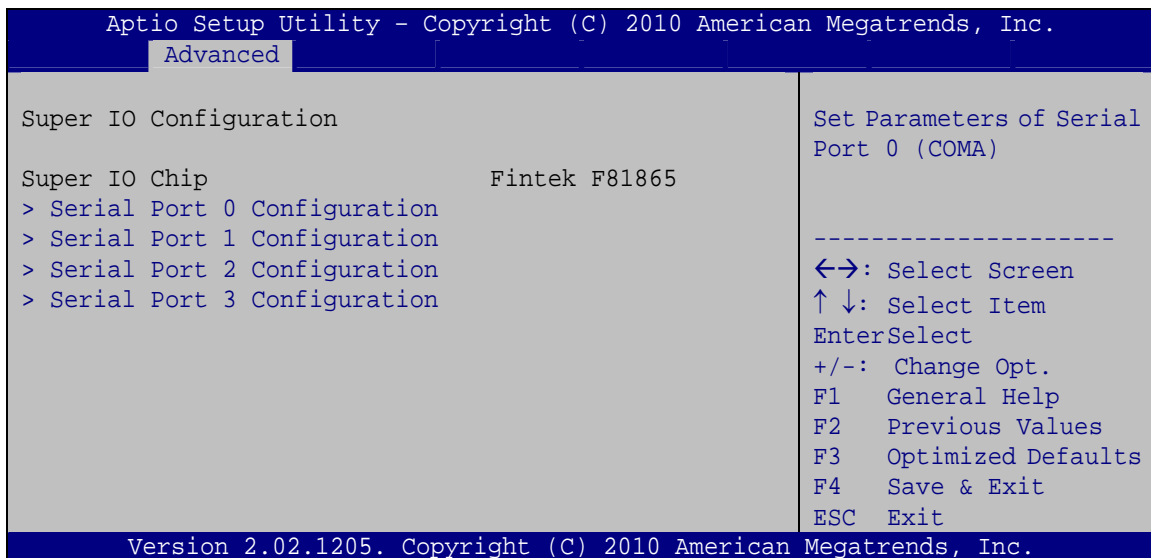
➔ **Disabled** Legacy USB support disabled

➔ **Enabled** **DEFAULT** Legacy USB support enabled

➔ **Auto** Legacy USB support disabled if no USB devices are connected

5.3.6 Super IO Configuration

Use the **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

5.3.7 H/W Monitor

The H/W Monitor menu (**BIOS Menu 9**) shows the operating temperature, fan speeds and system voltages.

Aptio Setup Utility - Copyright (C) 2010 American Megatrends, Inc.		
Advanced		
PC Health Status		
CPU Temperature	:+53 C	
SYS Temperature	:+29 C	
CPU FAN Speed	:4702 RPM	
SYS FAN Speed	:N/A	
VCC3V	:+3.296 V	
V_core	:+1.056 V	
+5V	:+1.056 V	
+12V	:+1.056 V	
+1.5V	:+1.512 V	
VSB3V	:+3.312 V	
VBAT	:+3.184 V	
CPU Smart Fan control	[Auto Mode]	
Temperature Bound 1	60	
Temperature Bound 2	50	
Temperature Bound 3	40	
Temperature Bound 4	30	
Sys Smart Fan control	[Auto Mode]	
Temperature Bound 1	60	
Temperature Bound 2	50	
Temperature Bound 3	40	
Temperature Bound 4	30	

←→: Select Screen

↑ ↓: Select Item

EnterSelect

+/-: Change Opt.

F1 General Help

F2 Previous Values

F3 Optimized Defaults

F4 Save & Exit

ESC Exit

BIOS Menu 9: Hardware Health Configuration

→ CPU Smart Fan Control [Auto Mode]

Use the **CPU Smart Fan Mode Control** option to configure the CPU fan.

→ Auto Mode	DEFAULT	The fan adjusts its speed using these settings by RPM:
		Temperature Bound 1
		Temperature Bound 2
		Temperature Bound 3
		Temperature Bound 4

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→ Manual Mode

The fan spins at the speed set in:
Manual Duty Cycle Setting
(Min=0, Max=100)

**NOTE:**

CPU fan functions are supported only when using a 4-pin fan. When using a 3-pin fan, the functions are not supported.

→ First Boundary Temperature [60]**WARNING:**

CPU failure can result if this value is set too high

When the fan is off, it will only start when the temperature exceeds this setting.

- Minimum Value: 0°C
- Maximum Value: 127°C

→ Second Boundary Temperature [50]**WARNING:**

CPU failure can result if this value is set too high

When the fan is off, it will only start when the temperature exceeds this setting.

- Minimum Value: 0°C
- Maximum Value: 127°C

→ Third Boundary Temperature [40]

**WARNING:**

CPU failure can result if this value is set too high

When the fan is off, it will only start when the temperature exceeds this setting.

- Minimum Value: 0°C
- Maximum Value: 127°C

→ Fourth Boundary Temperature [30]

**WARNING:**

CPU failure can result if this value is set too high

When the fan is off, it will only start when the temperature exceeds this setting.

- Minimum Value: 0°C
- Maximum Value: 127°C

→ SYS Smart Fan Control [Auto Mode]

Use the **SYS Smart Fan Control** option to configure the SYS fan.

→ Auto Mode	DEFAULT	The fan adjusts its speed using these settings by RPM:
		Temperature Bound 1
		Temperature Bound 2
		Temperature Bound 3
		Temperature Bound 4

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→ **Manual Mode**

The fan spins at the speed set in:
Manual Duty Cycle Setting
(Min=0, Max=100)

**NOTE:**

SYS fan functions are supported only when using a 4-pin fan. When using a 3-pin fan, the functions are not supported.

→ **First Boundary Temperature [60]****WARNING:**

CPU failure can result if this value is set too high

When the fan is off, it will only start when the temperature exceeds this setting.

- Minimum Value: 0°C
- Maximum Value: 127°C

→ **Second Boundary Temperature [50]****WARNING:**

CPU failure can result if this value is set too high

When the fan is off, it will only start when the temperature exceeds this setting.

- Minimum Value: 0°C
- Maximum Value: 127°C

→ **Third Boundary Temperature [40]**



WARNING:

CPU failure can result if this value is set too high

When the fan is off, it will only start when the temperature exceeds this setting.

- Minimum Value: 0°C
- Maximum Value: 127°C

→ **Fourth Boundary Temperature [30]**



WARNING:

CPU failure can result if this value is set too high

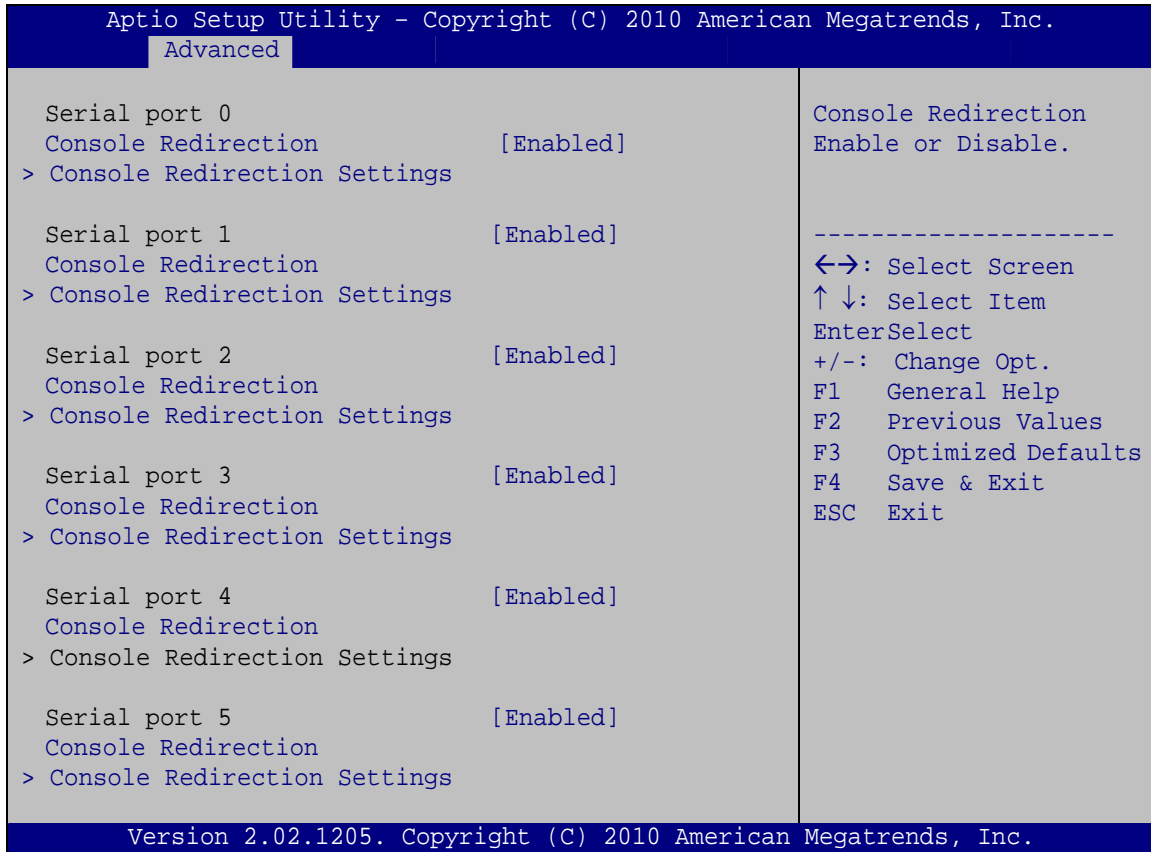
When the fan is off, it will only start when the temperature exceeds this setting.

- Minimum Value: 0°C
- Maximum Value: 127°C

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5.3.7.1 Serial Port Console Redirection

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



BIOS Menu 10: Serial Port Console Redirection Menu

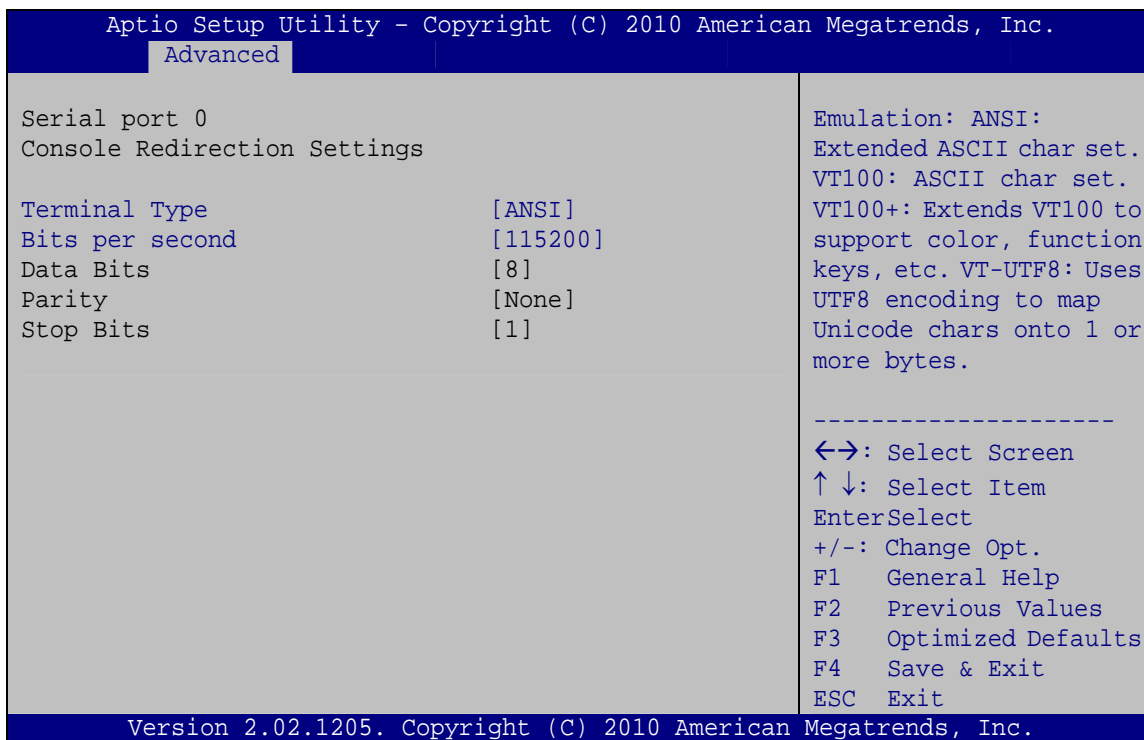
➔ Console Redirection

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

- ➔ **Disabled** Disabled the console redirection function
- ➔ **Enabled** Enabled the console redirection function

5.3.7.2 Console Redirection Settings

The **Console Redirection Settings** menu (**BIOS Menu 11**) allows the console redirection options to be configured. The option is active when Console Redirection option is enabled.



BIOS Menu 11: Console Redirection Settings

→ 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 transmission speed of the serial port.

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➔	9600		The transmission speed is 9600
➔	19200		The transmission speed is 19200
➔	38400		The transmission speed is 38400
➔	57600		The transmission speed is 57600
➔	115200	DEFAULT	The transmission speed is 115200

5.4 Chipset

Use the **Chipset** menu (**BIOS Menu 12**) to access the Northbridge 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.

```

Aptio Setup Utility - Copyright (C) 2010 American Megatrends, Inc.
Main      Advanced  Chipset    Boot      Security  Save & Exit

> North Bridge
> South Bridge
> Intel IDG SWSCI OpRegion

North Bridge Parameters
-----
<=>: Select Screen
↑ ↓: Select Item
EnterSelect
+/-: Change Opt.
F1   General Help
F2   Previous Values
F3   Optimized Defaults
F4   Save & Exit
ESC  Exit

Version 2.02.1205. Copyright (C) 2010 American Megatrends, Inc.

```

BIOS Menu 12: Chipset

5.4.1 Northbridge Configuration

Use the **Northbridge Chipset Configuration** menu (**BIOS Menu 13**) to configure the Northbridge chipset.

Aptio Setup Utility - Copyright (C) 2009 American Megatrends, Inc.		
Chipset		
Memory Information		Select which graphics controller to use as the primary boot device.
CPU Type	Clarksfield	
Total Memory	2048 MB (DDR3 1333)	----- ←→: Select Screen ↑ ↓: Select Item Enter Select +/-: Change Opt. F1 General Help F2 Previous Values F3 Optimized Defaults F4 Save & Exit ESC Exit
Memory Slot0	2048 MB (DDR3 1333)	
Memory Slot2	0 MB (DDR3 1333)	
CAS# Latency(tCL)	9	
RAS# Active Time(tRAS)	24	
Row Precharge Time(tRP)	9	
RAS# to CAS# Delay(tRCD)	9	
Write Recovery Time(tWR)	10	
Row Refresh Cycle Time(tRFC)	74	
Write to Read Delay(tWTR)	5	
Active to Active Delay(tRRD)	4	
Read CAS# Precharge(tRTP)	5	
Initiate Graphic Adapter	[PEG/IGD]	
Version 2.02.1205. Copyright (C) 2010 American Megatrends, Inc.		

BIOS Menu 13:Northbridge Chipset Configuration

➔ Initiate Graphics Adapter [PEG/IGD]

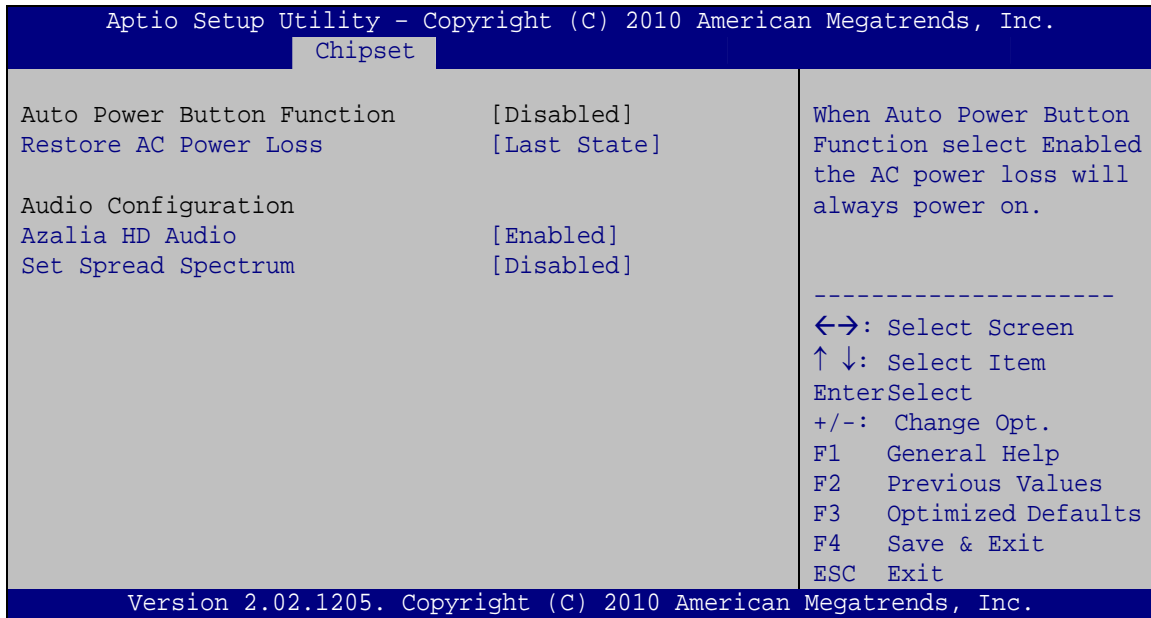
Use the **Initiate Graphics Adapter** option to select the graphics controller used as the primary boot device. Select either an integrated graphics controller (IGD) or a combination of PCI graphics controller, a PCI express (PEG) controller or an IGD. Configuration options are listed below:

- IGD
- PEG/IGD **DEFAULT**

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5.4.2 Southbridge Configuration

Use the **Southbridge Configuration** menu (**BIOS Menu 14**) to configure the Southbridge chipset.



BIOS Menu 14:Southbridge Chipset Configuration

➔ Restore AC Power Loss [Last State]

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

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

➔ 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

➔ **Set Spread Spectrum [Disabled]**

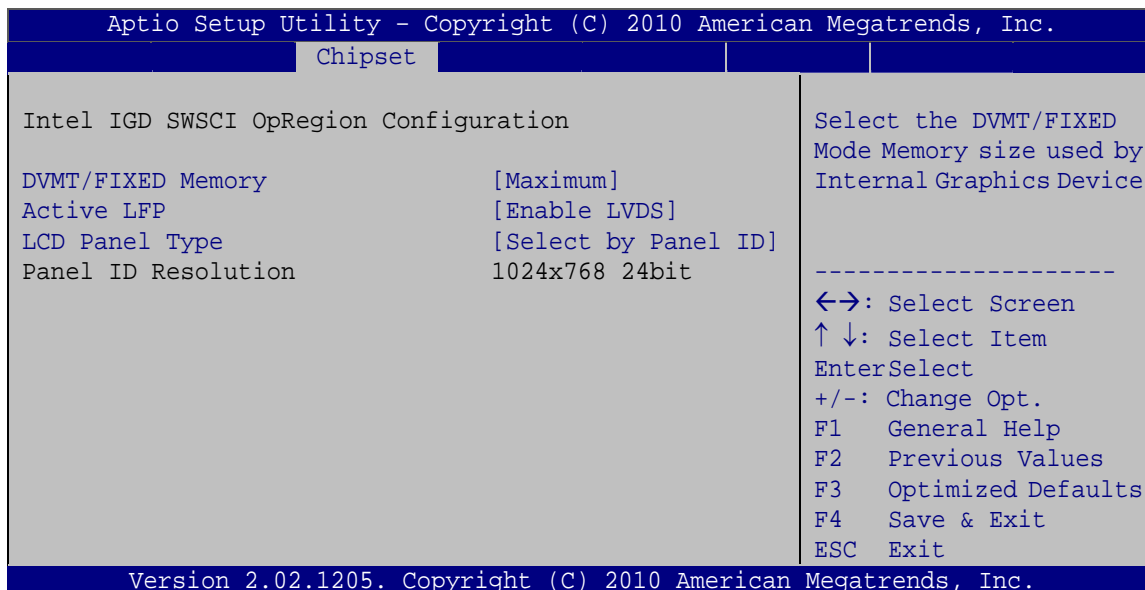
Use the **Set Spread Spectrum function** option to reduce the EMI. Excess EMI is generated when the system clock generator pulses have extreme values. Spreading the pulse spectrum modulates changes in the extreme values from spikes to flat curves, thus reducing the EMI. This benefit may in some cases be outweighed by problems with timing-critical devices, such as a clock-sensitive SCSI device.

➔ **Disabled** **DEFAULT** EMI not reduced

➔ **Enabled** EMI reduced

5.4.3 Intel IGD SWSCI OpRegion

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



BIOS Menu 15: Intel IGD SWSCI OpRegion

KINO-HM551**→ DVMT/FIXED Memory [Maximum]**

Use the **DVMT/FIXED Memory** option to select memory size used by the Internal Graphics Device. Configuration options are listed below.

- 128 MB
- 256 MB
- Maximum **DEFAULT**

→ Active LFP [Enable LVDS]

Use the **Active LFP** option to enable the LVDS connector. Configuration options are listed below.

- Enable LVDS **DEFAULT**
- Disable LVDS

→ LCD Panel Type [Select by Panel ID]

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

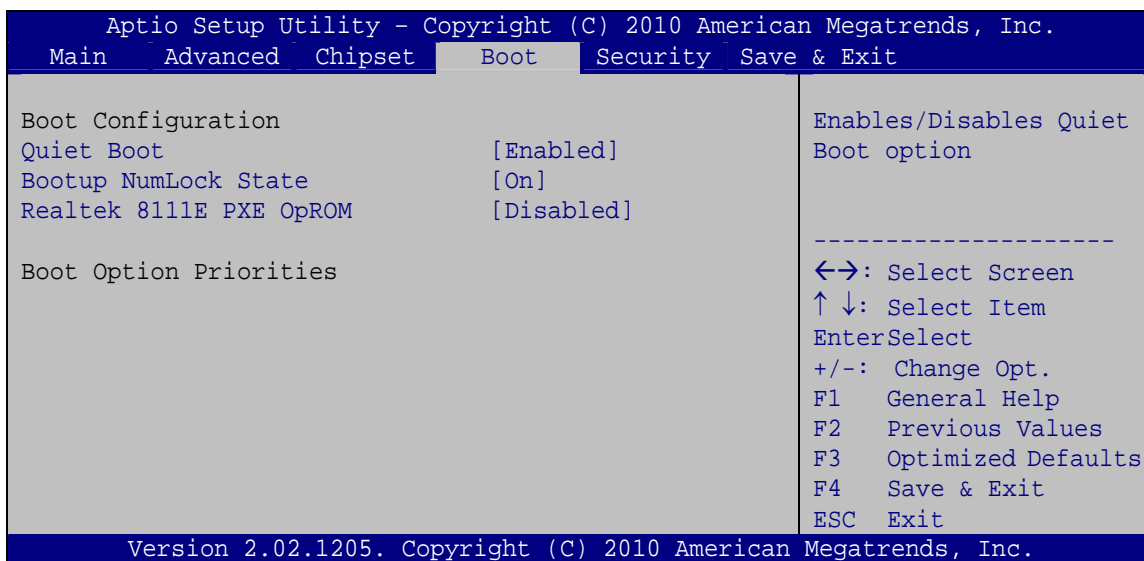
- Select by Panel ID **DEFAULT**
- 800x600 18bit
- 1024x768 18bit
- 1024x768 24bit
- 1280x800 18bit
- 1280x1024 48bit
- 1366x768 18bit
- 1400x1050 48bit
- 1440x900 48bit
- 1600x900 48bit
- 1600x1200 48bit
- 1680x1050 48bit
- 1920x1080 48bit
- 1920x1200 48bit
- 2048x1536 48bit

→ Panel ID Resolution

Displays the panel resolution detected by the BIOS.

5.5 Boot

Use the **Boot** menu (**BIOS Menu 16**) to configure system boot options.



BIOS Menu 16: Boot

→ 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

→ Bootup NumLock [On]

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

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- ➔ **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.
- ➔ **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.

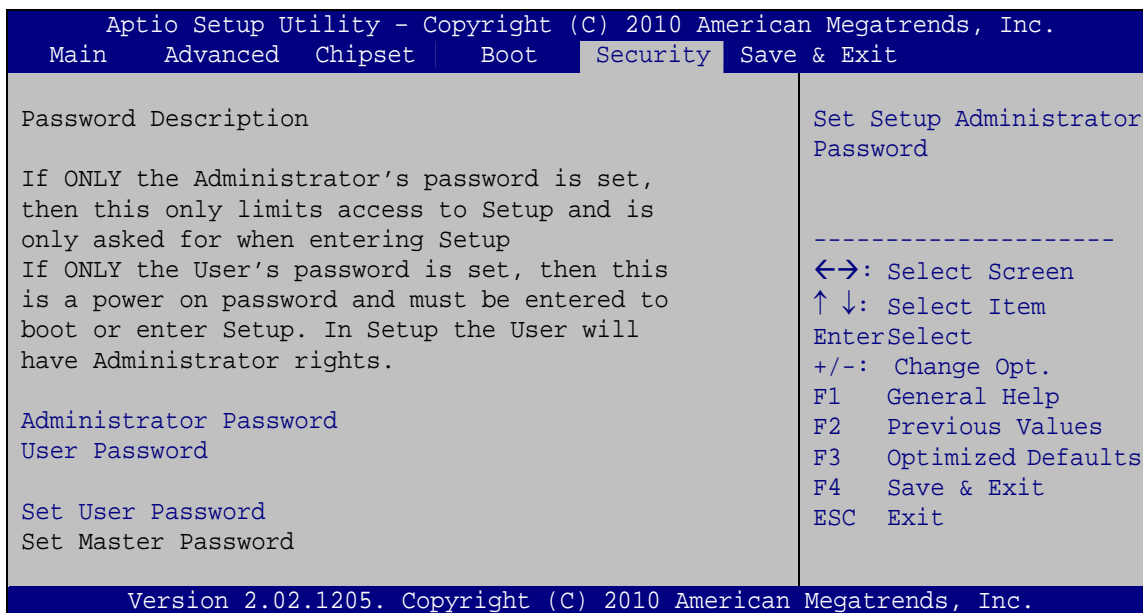
➔ **Realtek 8111E PXE OpROM [Disabled]**

Use the **Realtek 8111E PXE OpROM** option to enable the Realtek 8111E PCIe GbE controller to boot the system.

- ➔ **Disabled DEFAULT** Cannot be booted from a remote system through the Realtek 8111E PCIe GbE controller
- ➔ **Enabled** Can be booted from a remote system through the Realtek 8111E PCIe GbE controller

5.6 Security

Use the **Security** menu (**BIOS Menu 17**) to set system and user passwords.



BIOS Menu 17: 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.

➔ Set User Password

Use the **Set User Password** to set the HDD User Password.



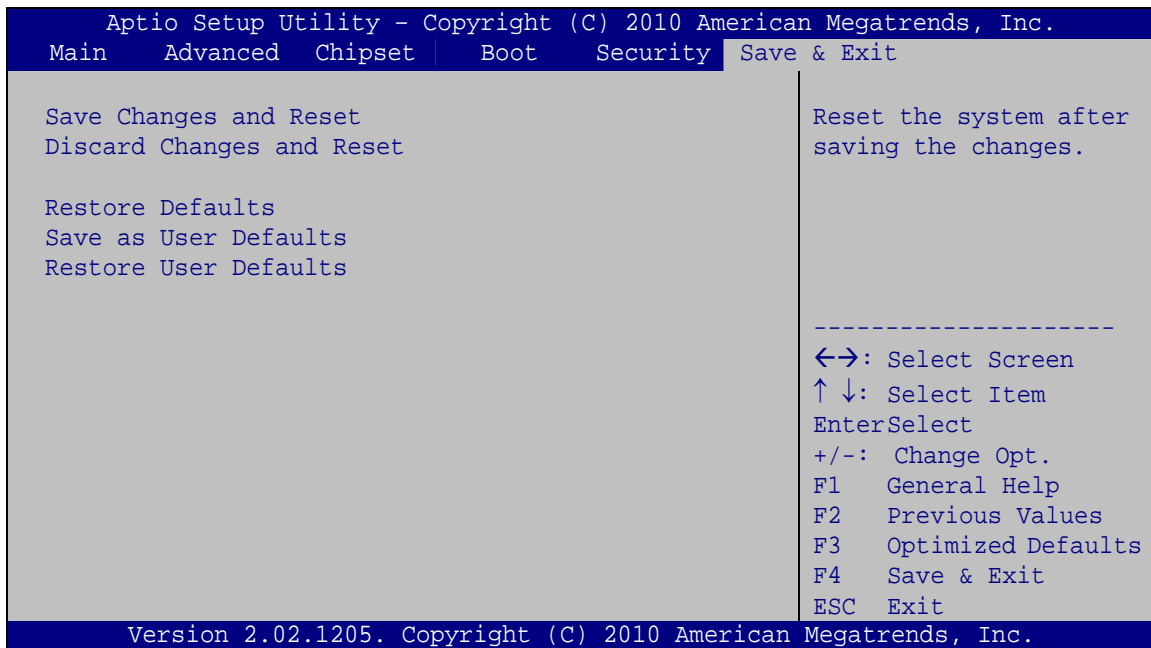
NOTE:

It is recommended to reboot the system after setting the HDD password.

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5.7 Exit

Use the **Exit** menu (**BIOS Menu 18**) to load default BIOS values, optimal failsafe values and to save configuration changes.

**BIOS Menu 18: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 Menu Options

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Appendix

B

Terminology

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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.
APM	The Advanced Power Management (APM) application program interface (API) enables the inclusion of power management in the BIOS.
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.
CMOS	Complimentary metal-oxide-conductor is a type of integrated circuit used in chips like static RAM and microprocessors.
COM	COM is used to refer to serial ports. Serial ports offer serial communication to expansion devices. The serial port on a personal

	computer is usually a male DE-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.
EHCI	The Enhanced Host Controller Interface (EHCI) specification is a register-level interface description for USB 2.0 Host Controllers.
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
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.
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.
MAC	The Media Access Control (MAC) protocol enables several terminals or network nodes to communicate in a LAN, or other multipoint networks.

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PCIe	PCI Express (PCIe) is a communications bus that uses dual data lines for full-duplex (two-way) serial (point-to-point) communications between the SBC components and/or expansion cards and the SBC chipsets. Each line has a 2.5 Gbps data transmission rate and a 250 MBps sustained data transfer rate.
POST	The Power-on Self Test (POST) is the pre-boot actions the system performs when the system is turned-on.
QVGA	Quarter Video Graphics Array (QVGA) refers to a display with a resolution of 320 x 240 pixels.
RAM	Random Access Memory (RAM) is a form of storage used in computer. RAM is volatile memory, so it loses its 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 3Gb/s 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, while

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

C.1 Introduction

The DIO connector on the KINO-HM551 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

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C.2 Assembly Language Sample 1

```

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

```

AL low byte = value

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

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

Watchdog Timer

**NOTE:**

The following discussion applies to DOS environment. IEI support is contacted or the IEI website visited for specific drivers for more sophisticated operating systems, e.g., Windows and Linux.

The Watchdog Timer is provided to ensure that standalone systems can always recover from catastrophic conditions that cause the CPU to crash. This condition may have occurred by external EMI or a software bug. When the CPU stops working correctly, Watchdog Timer either performs a hardware reset (cold boot) or a Non-Maskable Interrupt (NMI) to bring the system back to a known state.

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 D-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. While 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.

**NOTE:**

When exiting a program it is necessary to disable the Watchdog Timer, otherwise the system resets.

Example program:

; INITIAL TIMER PERIOD COUNTER

;

W_LOOP:

MOV *AX, 6F02H* ;setting the time-out value

MOV *BL, 30H* ;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

E

Hazardous Materials Disclosure

E.1 Hazardous Material 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-HM551

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
<p>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。</p> <p>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。</p>						