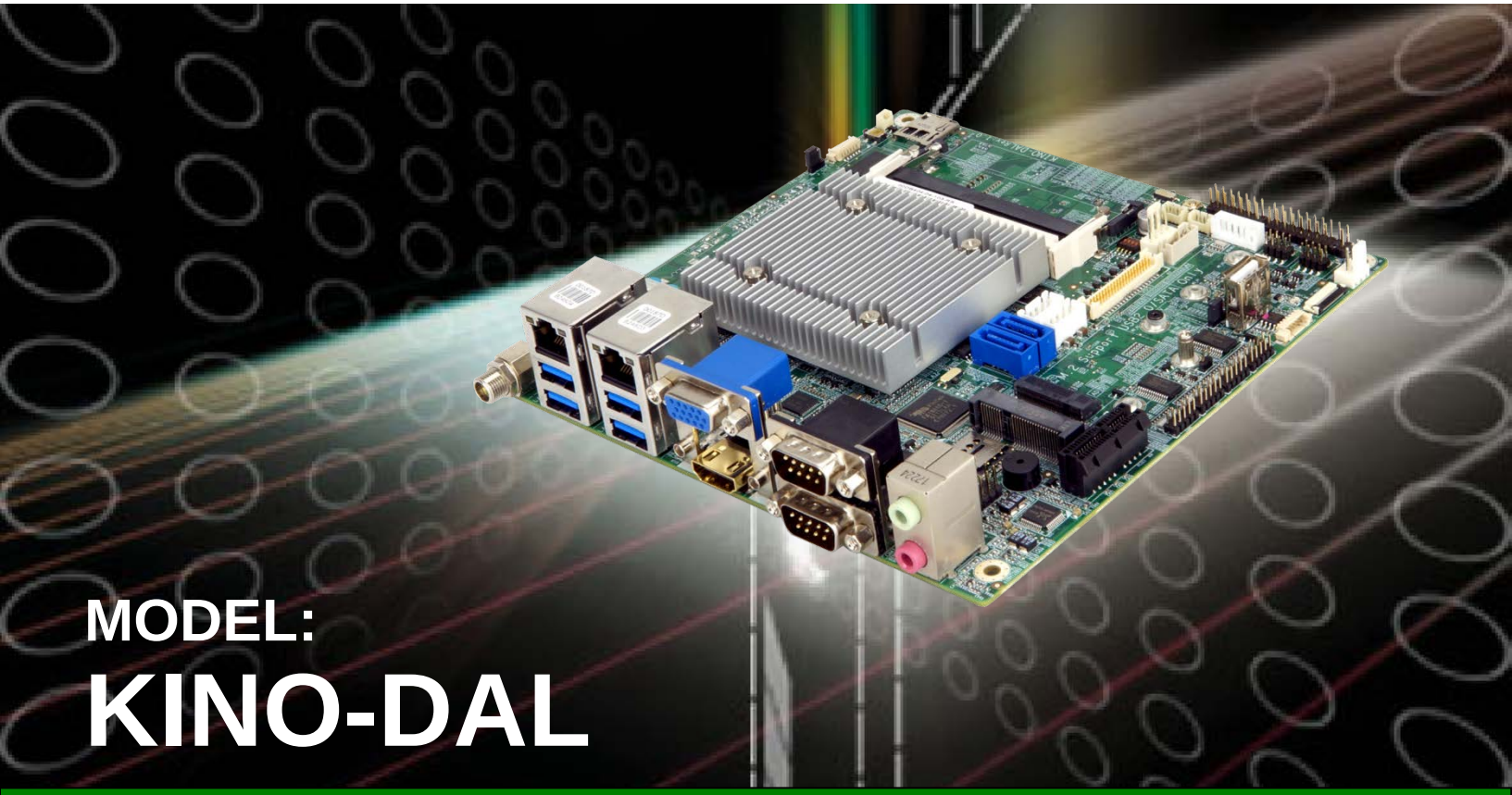
IEI Integration Corp.



MODEL:

KINO-DAL

Mini-ITX SBC with 14nm Intel® Atom™, Pentium® or Celeron® On-board SoC, HDMI, LVDS, VGA, Dual PCIe GbE, USB 3.0, PCIe Mini, M.2, SATA 6Gb/s, RS-232/422/485, Audio, TPM and RoHS

User Manual

Rev. 1.01 - March 27, 2018

RoHS Lead Free

Revision

Date	Version	Changes
March 27, 2018	1.01	Changed the SIM card slot to optional item
January 4, 2018	1.00	Initial release

Copyright

COPYRIGHT NOTICE

TRADEMARKS

Manual Conventions

WARNING

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

CAUTION

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

NOTE

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

HOT SURFACE

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

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Chapter

1

Introduction

1.1 Introduction

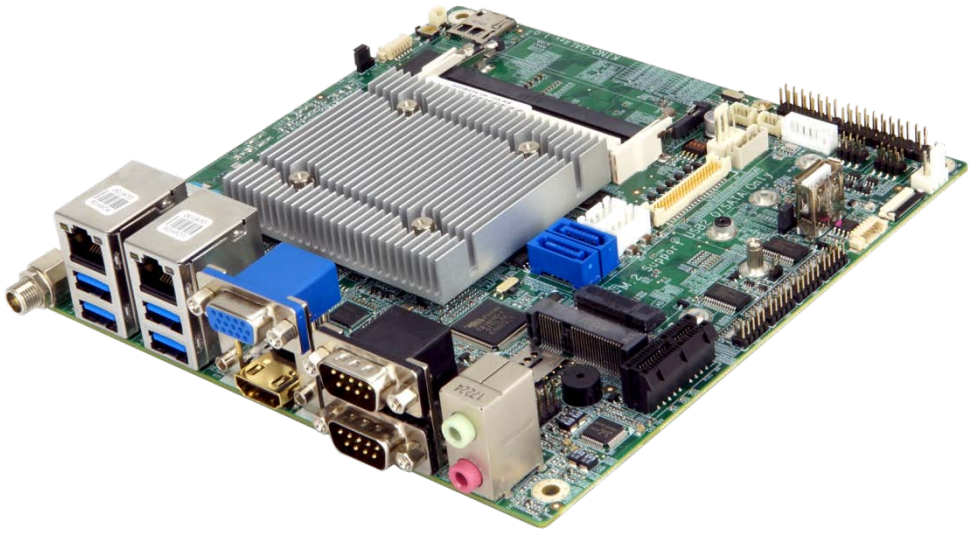


Figure 1-1: KINO-DAL

The KINO-DAL series is a Mini-ITX form factor single bard computer. It has an on-board 14nm Intel® Atom™, Pentium® or Celeron® processor, and supports two 204-pin 1867/1600 MHz dual-channel DDR3 Low Voltage (DDR3L) SDRAM SO-DIMM slots with up to 8.0 GB of memory.

The KINO-DAL series includes one internal LVDS connector, one VGA connector and one HDMI connectors for triple independent. Expansion and I/O include one PCIe x1 slot, one PCIe Mini slot supporting WWAN modules, one M.2 B-key slot for expansion, four USB 3.0 connectors on the rear panel, four USB 2.0 connectors by pin header and two SATA 6Gb/s connectors. Serial device connectivity is provided by four internal RS-232 connectors and two external RS-232/422/485 connectors. Two RJ-45 GbE connectors provide the system with smooth connections to an external LAN.

1.2 Model Variations

The model variations of the KINO-DAL series are listed below.

Model No.	SoC	Power Input	Operating Temp.
KINO-DAL-N2	Intel® Pentium® N4200	12 V DC	-20°C ~ 70°C
KINO-DAL-N1	Intel® Celeron® N3350	12 V DC	-20°C ~ 70°C
KINO-DAL-E3W2*	Intel® Atom™ E3950	9 V ~ 30 V DC	-40°C ~ 85°C
KINO-DAL-E2W2	Intel® Atom™ E3940	9 V ~ 30 V DC	-40°C ~ 85°C
KINO-DAL-E1W2	Intel® Atom™ E3930	9 V ~ 30 V DC	-40°C ~ 85°C
*By order production, MOQ 100			

Table 1-1: KINO-DAL Model Variations

1.3 Features

Some of the KINO-DAL motherboard features are listed below:

- Mini-ITX motherboard supports 14nm Intel® Atom™/Pentium®/Celeron® on-board SoC
- Triple independent display support
- Two 1867/1600 MHz DDR3L SO-DIMM slots support up to 8 GB of memory
- Two SATA 6Gb/s connectors with 5 V / 12 V power output
- Full-size/half-size PCIe Mini card slot with optional SIM card holder for WWAN expansion
- M.2 2242/2260/2280 B-key modules supported
- Four USB 3.0 external connectors
- Two external RS-232/422/485 connectors and four internal RS-232 connectors
- Optional 9 V ~ 30 V DC wide power input range
- IEI One Key Recovery solution allows you to create rapid OS backup and recovery

1.4 Connectors

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

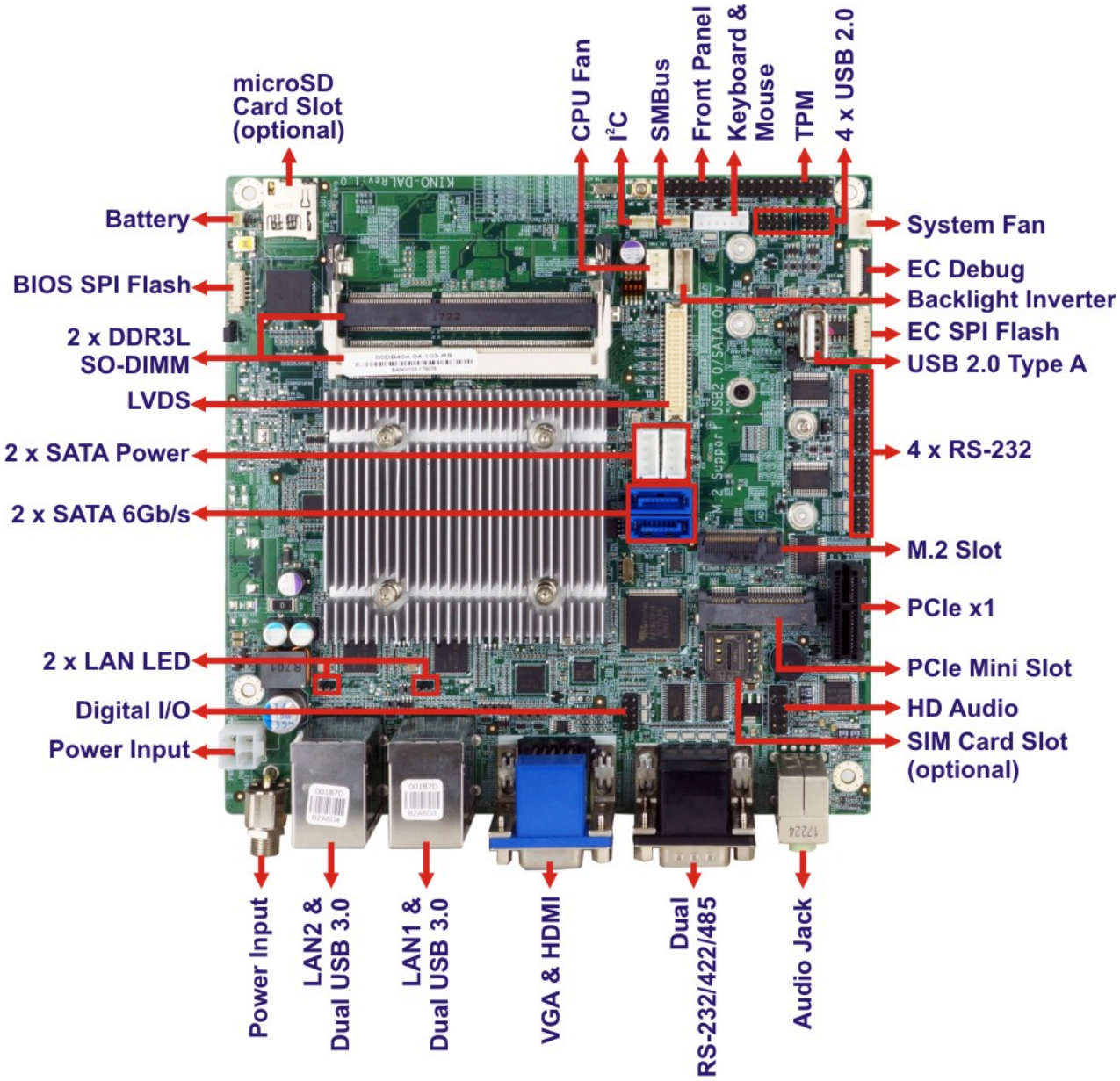


Figure 1-2: Connectors (Front Side)

1.5 Dimensions

The dimensions of the board are listed below:

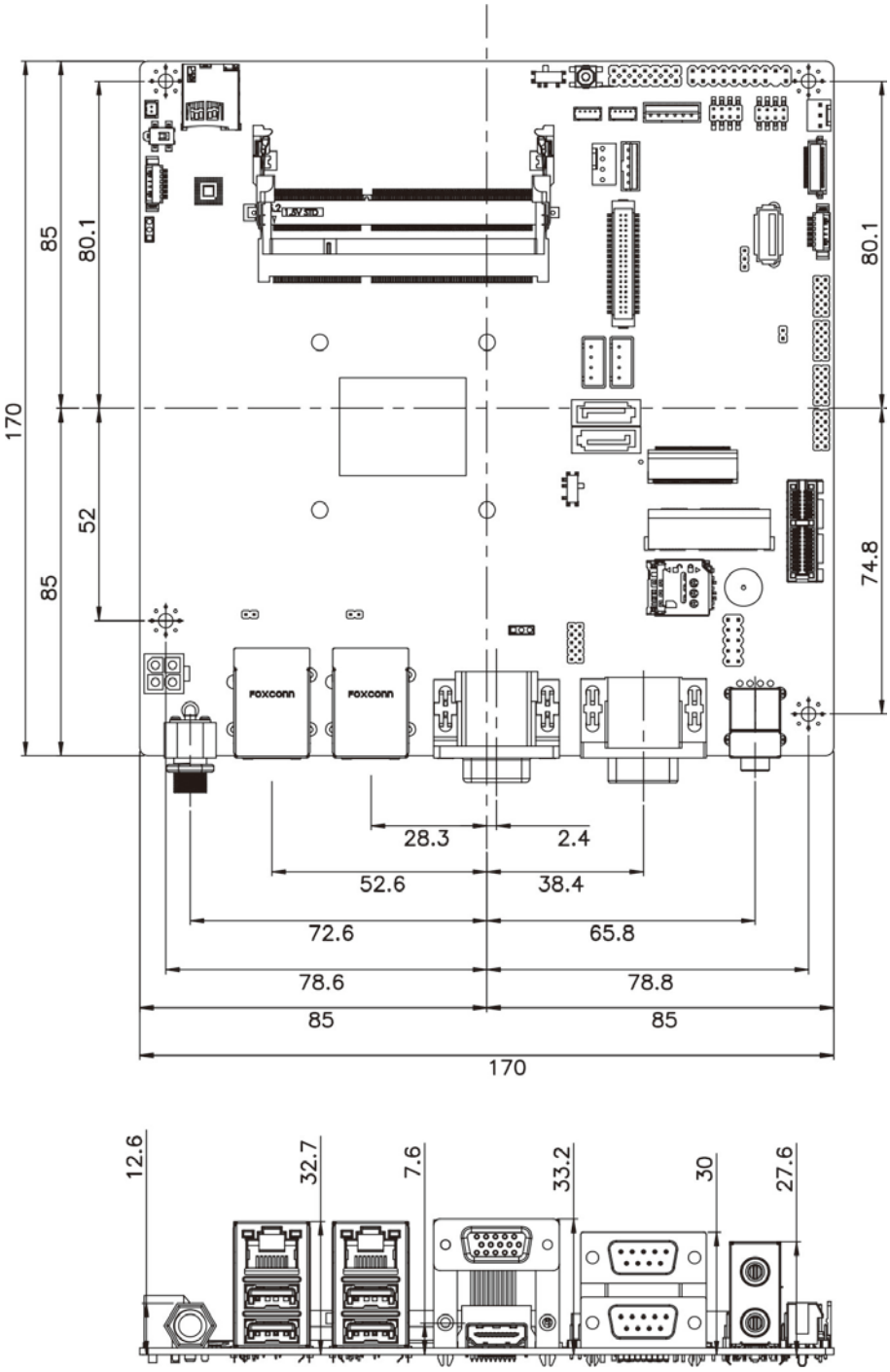


Figure 1-3: Dimensions (mm)

1.6 Data Flow

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

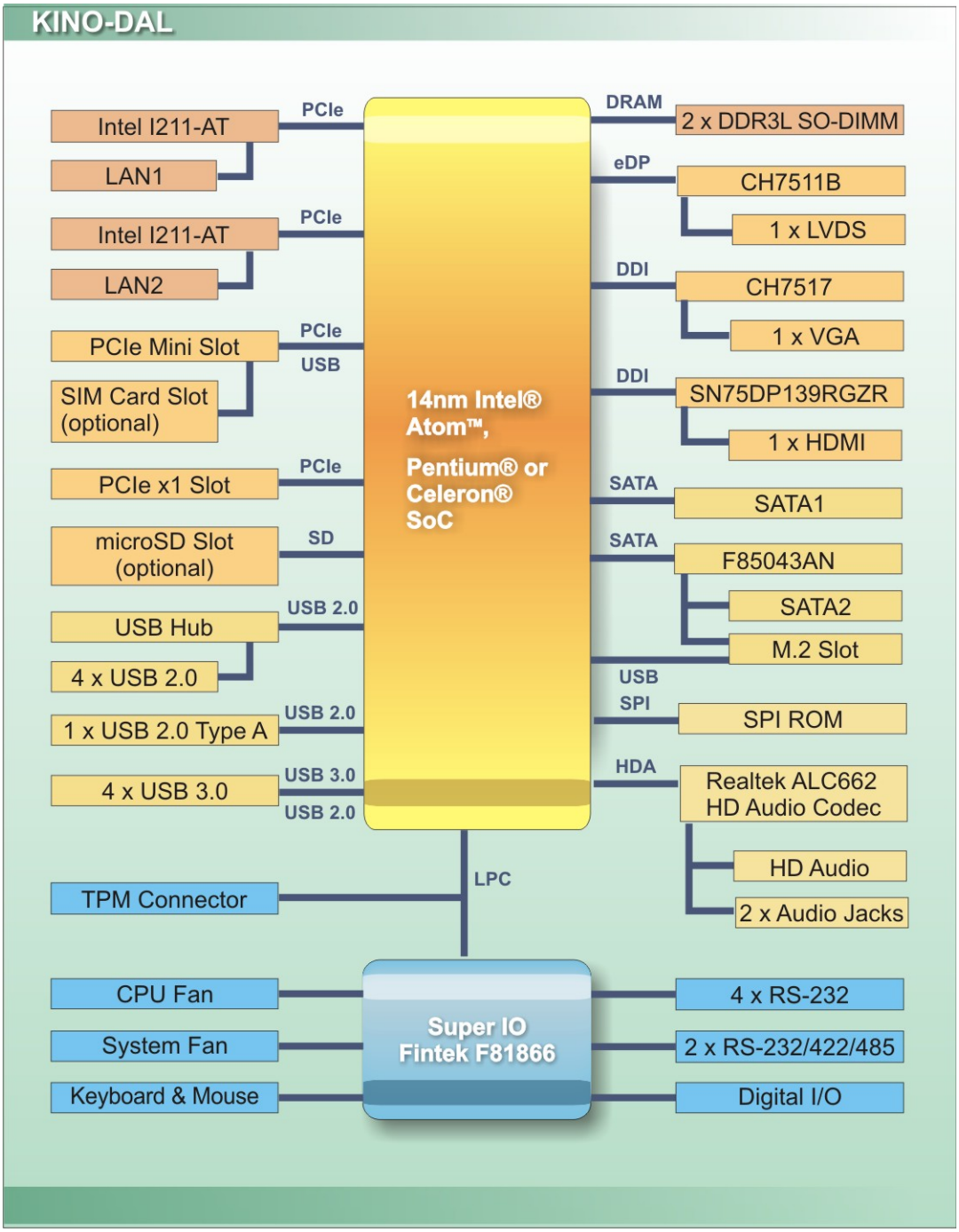


Figure 1-4: Data Flow Diagram

1.7 Technical Specifications

KINO-DAL technical specifications are listed below.

Specification	KINO-DAL
Form Factor	Mini-ITX
SoC	Intel® Pentium® N4200 on-board SoC (up to 2.5 GHz, quad-core, 2 MB cache, TDP=6 W) Intel® Celeron® N3350 on-board SoC (up to 2.4 GHz, dual-core, 2 MB cache, TDP=6 W) Intel® Atom™ E3950 on-board SoC (up to 2.0 GHz, quad-core, 2 MB cache, TDP=12 W) Intel® Atom™ E3940 on-board SoC (up to 1.8 GHz, quad-core, 2 MB cache, TDP=9 W) Intel® Atom™ E3930 on-board SoC (up to 1.8 GHz, dual-core, 2 MB cache, TDP=6 W)
BIOS	AMI UEFI BIOS
Memory	Two 204-pin 1867/1600 MHz dual-channel DDR3L SDRAM SO-DIMM slots (system max. 8 GB) Optional eMMC 5.0 (up to 32 GB)
Graphics	9th generation Intel® HD Graphics with 18 execution units, supporting 4K codec decode & encode for HEVC, H.264, VP8, SVC and MVC
Display Output	Triple independent display 1 x 18/24-bit dual channel LVDS (up to 1920x1200 @ 60Hz) 1 x VGA (up to 1920x1200 @ 60Hz) 1 x HDMI (up to 3840x2160 @ 30Hz)
Ethernet	Dual Intel® I211-AT PCIe GbE controller
Digital I/O	8-bit digital I/O by 10-pin (2x5) header
Super IO	Fintek F81866
Embedded Controller	ITE IT8528

Specification	KINO-DAL
Audio	Realtek ALC662 HD Audio codec
Watchdog Timer	Software programmable support 1~255 sec. system reset
I/O Interface	
Audio Connector	2 x Audio jack (line-out, mic-in) 1 x Front audio by 10-pin (2x5) header
Ethernet	2 x RJ-45 GbE port
Keyboard/Mouse	1 x KB/MS by 6-pin (1x6) wafer
Serial Ports	2 x RS-232/422/485 by DB-9 4 x RS-232 by 10-pin (2x5) header
USB Ports	4 x USB 3.0 on rear I/O 4 x USB 2.0 by 8-pin (2x4) header 1 x USB 2.0 by internal 180° Type A
Front Panel	1 x Front panel connector by 14-pin (2x7) header for power LED, HDD LED, speaker, power button and reset button
LAN LED	2 x LAN link LED connector by 2-pin header
Fan	1 x CPU smart fan connector by 4-pin (1x4) wafer 1 x System smart fan connector by 3-pin (1x3) wafer
SMBus	1 x SMBus connector by 4-pin (1x4) wafer
I^2C	1 x I^2C connector by 4-pin (1x4) wafer
TPM	1 x TPM connector by 20-pin (2x10) header
Storage	2 x SATA 6Gb/s with 5 V / 12 V SATA power connectors 1 x microSD socket (optional)
Expansion	1 x Full-size/Half-size PCIe Mini card slot (with optional SIM card holder) 1 x M.2 2242/2260/2280 slot (B key, SATA 1 port + USB 2.0 signal) 1 x PCIe x1 slot
Environmental and Power Specifications	

Specification	KINO-DAL
Power Supply	Default: 12 V DC input Optional: 9 V ~ 30 V DC input (KINO-DAL-ExW2) AT/ATX mode supported
Power Connector	1 x External DC power jack (ø5.5 mm) 1 x Internal power connector by 4-pin (2x2) connector
Power Consumption	+12 V@ 3.64 A (Intel® Pentium® N4200 processor with two 4 GB 1600 MHz DDR3L memory)
Operating Temperature	-20°C ~ 70°C / -40°C ~ 85°C (KINO-DAL-ExW2 series)
Storage Temperature	-40°C ~ 85°C
Humidity	5% ~ 95%, non-condensing
Safety	CE, FCC
Physical Specifications	
Dimensions	170 mm x 170 mm
Weight GW/NW	1100 g / 700 g

Table 1-2: Technical Specifications

Chapter

2

Unpacking

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-DAL is unpacked, please do the following:

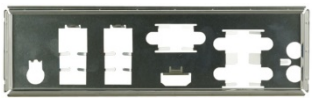
- Follow the antistatic guidelines above.
- Make sure the packing box is facing upwards when opening.
- Make sure all the packing list items are present.

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

The KINO-DAL is shipped with the following components:

Quantity	Item and Part Number	Image
1	KINO-DAL single board computer	
1	SATA with 5V/12V output cable kit (**P/N**: 32801-000100-300-RS)	
1	I/O shielding	
1	Quick Installation Guide	

2.4 Optional Items

The following are optional components which may be separately purchased:

Item and Part Number	Image
KB/MS PS/2 Y-cable, 135 mm, P=2.0 (**P/N**: 32000-023800-RS)	
Dual USB cable (wo bracket), 210mm, P=2.0 (**P/N**: 32000-070301-RS)	
RS-232 cable, 200mm, P=2.0 (**P/N:** 32205-002700-100-RS)	
Infineon TPM 2.0 module, 20-pin, firmware v5.5 (**P/N**: TPM-IN02-R20)	

Chapter

3

Connectors

3.1 Peripheral Interface Connectors

This chapter details all the jumpers and connectors.

3.1.1 KINO-DAL Layout

The figures below show all the connectors and jumpers.

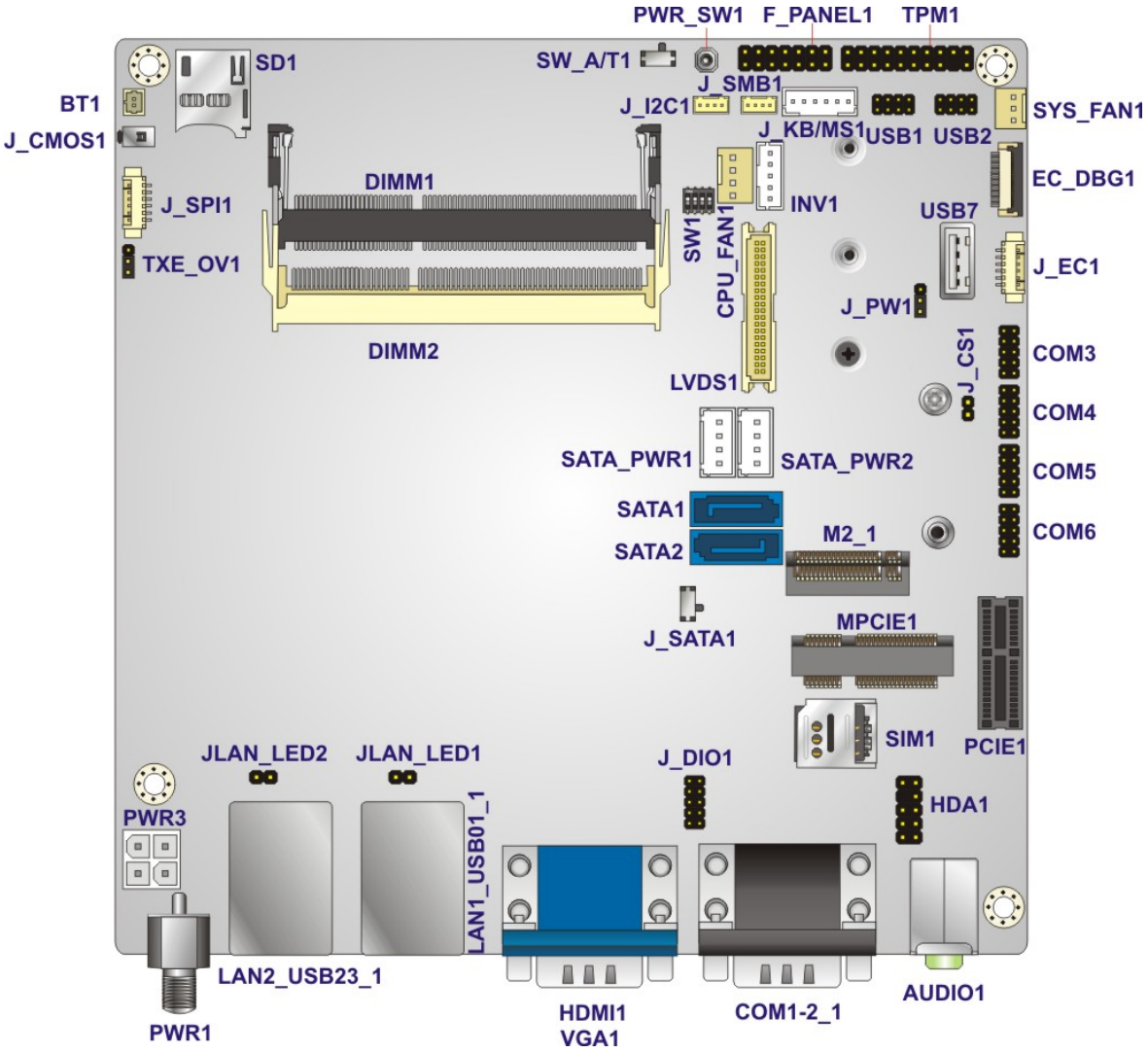


Figure 3-1: Connector and Jumper Locations

3.1.2 Peripheral Interface Connectors

The table below lists all the connectors on the board.

Connector	Type	Label
Audio connector	10-pin header	HDA1
Battery connector	2-pin wafer	BT1
Chassis intrusion connector	2-pin header	J_CS1
DC-IN power connector	4-pin Molex	PWR3
Digital I/O connector	10-pin header	J_DIO1
Fan connector, CPU	4-pin wafer	CPU_FAN1
Fan connector, system	3-pin wafer	SYS_FAN1
Front panel connector	14-pin header	F_PANEL1
I^2C connector	4-pin wafer	J_I2C1
Keyboard & mouse connector	6-pin wafer	J_KB/MS1
LAN LED connectors	2-pin header	JLAN_LED1, JLAN_LED2
LCD inverter connector	5-pin wafer	INV1
LVDS connector	40-pin crimp	LVDS1
M.2 slot	M.2 B-key slot	M2_1
Memory slot	204-pin DDR3L SO-DIMM	DIMM1, DIMM2
microSD slot (optional)	microSD slot	SD1
PCIe Mini card slot	PCIe Mini slot	MPCIE1
PCIe x1 slot	PCIe x1 slot	PCIE1
Power button	On-board power button	PWR_SW1

RS-232 serial port connectors	10-pin header	COM3, COM4, COM5, COM6
SATA 6Gb/s drive connectors	7-pin SATA connector	SATA1, SATA2
SATA power connectors	4-pin wafer	SATA_PWR1, SATA_PWR2
SIM card slot (optional)	micro-SIM card slot	SIM1
SMBus connector	4-pin wafer	J_SMB1
SPI flash connector, BIOS	6-pin wafer	J_SPI1
SPI flash connector, EC	6-pin wafer	J_EC1
TPM connector	20-pin header	TPM1
USB 2.0 connector	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
Audio jack	Audio jack	AUDIO1
DC-IN power jack	Power jack	PWR1
HDMI connector	HDMI	HDMI1
LAN and USB 3.0 combo connectors	RJ-45, USB 3.0	LAN1_USB01_1, LAN2_USB23_1
RS-232/422/485 serial port connectors	DB-9	COM1-2_1
VGA connector	DB-15	VGA1

Table 3-2: Rear Panel Connectors

3.2 Internal Peripheral Connectors

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

3.2.1 Audio Connector

CN Label: **HDA1**

CN Type: 10-pin header, p=2.54 mm

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

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

The audio connector supporting High-Definition Audio is connected to external audio devices including speakers and microphones for the input and output of audio signals to and from the system.

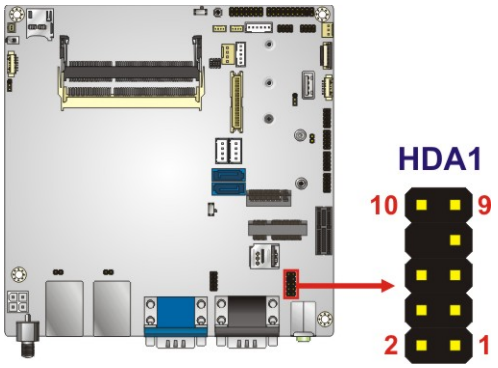


Figure 3-2: Audio Connector Location

Pin	Description	Pin	Description
1	MIC2-L	2	GND
3	MIC2-R	4	Pre-Sense#
5	LINE2-R	6	MIC2-JD
7	GND	8	Key
9	LINE2-L	10	LINE2-JD

Table 3-3: Audio Connector Pinouts

3.2.2 Battery Connector

CAUTION:

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

Dispose of used batteries according to instructions and local regulations.

NOTE:

It is recommended to attach the RTC battery onto the system chassis in which the KINO-DAL is installed.

CN Label:	**BT1**
CN Type:	2-pin wafer, p=1.25 mm
CN Location:	See **Figure 3-3**
CN Pinouts:	See **Table 3-4**

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

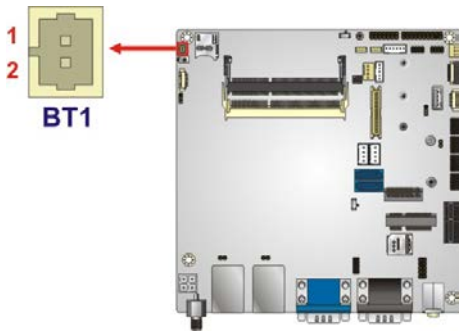


Figure 3-3: Battery Connector Location

Pin	Description
1	RTC Battery+
2	RTC Battery-

Table 3-4: Battery Connector Pinouts

3.2.1 Chassis Intrusion Connector

CN Label: **J_CS1**

CN Type: 2-pin header, , p=2.0 mm

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

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

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

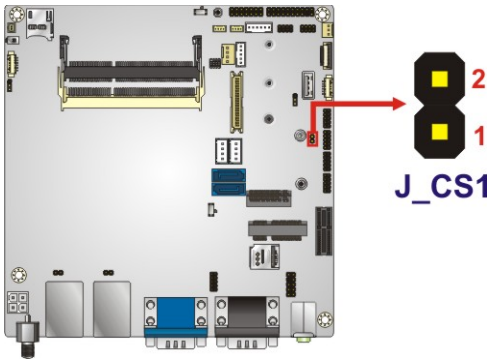


Figure 3-4: Chassis Intrusion Connector Location

Pin	Description
1	+V3.3A_EC
2	CHASSIS_EC

Table 3-5: Chassis Intrusion Connector Pinouts

3.2.1 DC-IN Power Connector

CN Label: **PWR3**

CN Type: 4-pin Molex, p=4.2 mm

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

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

The connector supports power input. The input voltage varies by models:

- 12 V DC: KINO-DAL-N2
  KINO-DAL-N1
- 9 V ~ 30 V DC: KINO-DAL-E3W2
  KINO-DAL-E2W2
  KINO-DAL-E1W2

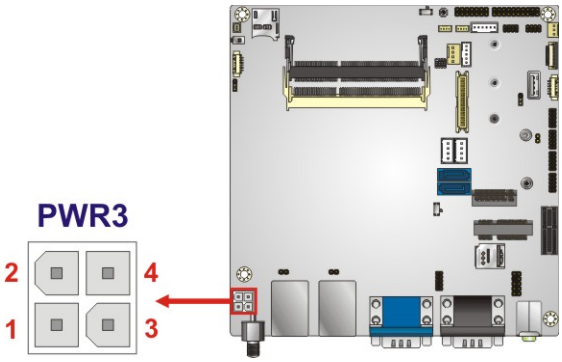


Figure 3-5: DC-IN Power Connector Location

Pin	Description	Pin	Description
1	GND	2	GND
3	VCC	4	VCC

Table 3-6: DC-IN Power Connector Pinouts

3.2.2 Digital I/O Connector

CN Label: **J_DIO1**

CN Type: 10-pin header, p=2.00 mm

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

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

The 8-bit digital I/O connector provides programmable input and output for external devices.

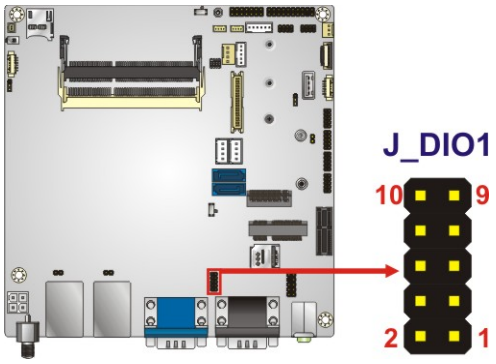


Figure 3-6: Digital I/O Connector Location

Pin	Description	Pin	Description
1	GND	2	+5V
3	D_OUT3	4	D_OUT2
5	D_OUT1	6	D_OUT0
7	D_IN3	8	D_IN2
9	D_IN1	10	D_IN0

Table 3-7: Digital I/O Connector Pinouts

3.2.3 Fan Connector, CPU

CN Label: **CPU_FAN1**

CN Type: 4-pin wafer, p=2.54 mm

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

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

The fan connector attaches to a cooling fan.

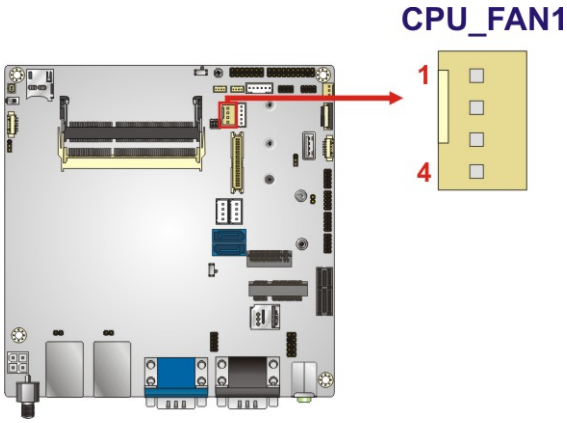


Figure 3-7: CPU Fan Connector Locations

Pin	Description
1	GND
2	12V
3	FAN_IO
4	FANCTL

Table 3-8: CPU Fan Connector Pinouts

3.2.1 Fan Connector, System

CN Label: **SYS_FAN1**

CN Type: 3-pin wafer, p=2.54 mm

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

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

The fan connector attaches to a cooling fan.

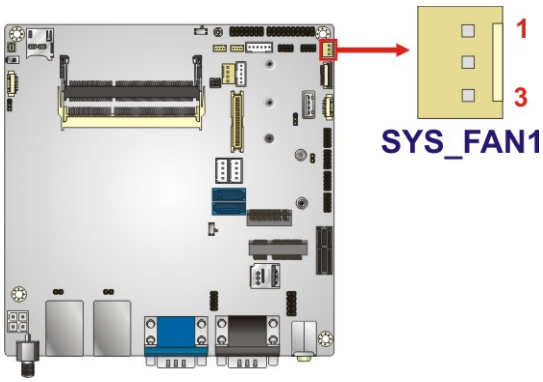


Figure 3-8: System Fan Connector Locations

Pin	Description
1	FAN_IN
2	12V
3	GND

Table 3-9: System Fan Connector Pinouts

3.2.2 Front Panel Connector

CN Label: **F_PANEL1**

CN Type: 14-pin header, p=2.54 mm

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

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

The front panel connector connects to the indicator LEDs, buttons and speaker on the system front panel.

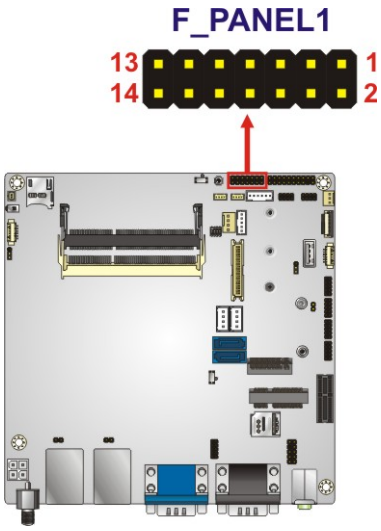


Figure 3-9: Front Panel Connector Location

Pin	Description	Pin	Description
1	PWR_LED+	2	SPKR+
3	NC	4	NC
5	PWR_LED-	6	NC
7	PWR_SW+	8	SPKR-
9	PWR_SW-	10	NC
11	HDD_LED+	12	RESET_SW+
13	HDD_LED-	14	RESET_SW-

Table 3-10: Front Panel Connector Pinouts

3.2.1 I²C Connector

CN Label: **J_I2C1**

CN Type: 4-pin wafer, p=1.25 mm

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

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

The I²C connector is used to connect I²C-bus devices to the mainboard.

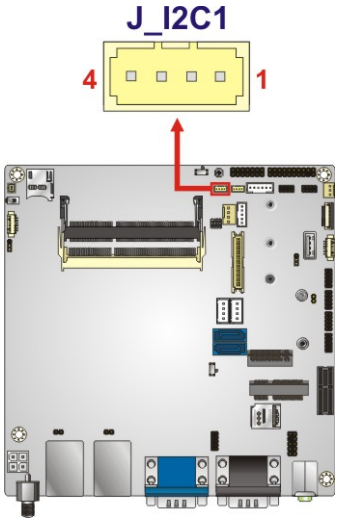


Figure 3-10: I2C Connector Pinout Locations

Pin	Description
1	GND
2	I2C_DATA
3	I2C_CLK
4	+5V

Table 3-11: I2C Connector Pinouts

3.2.2 Keyboard and Mouse Connector

CN Label: **J_KB/MS1**

CN Type: 6-pin wafer, p=2.00 mm

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

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

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

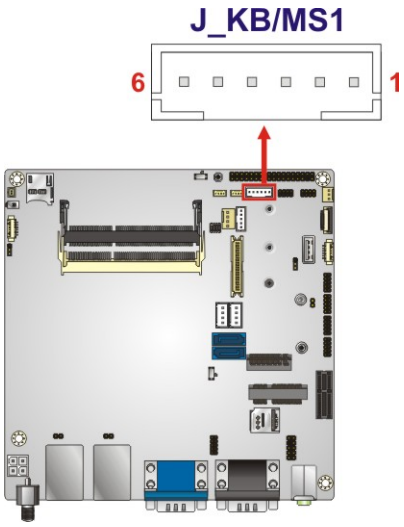


Figure 3-11: Keyboard and Mouse Connector Location

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

Table 3-12: Keyboard and Mouse Connector Pinouts

3.2.3 LAN LED Connectors

CN Label: **JLAN_LED1, JLAN_LED2**

CN Type: 2-pin header, p=2.00 mm

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

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

The LAN LED connectors connect to the LAN link LEDs on the system.

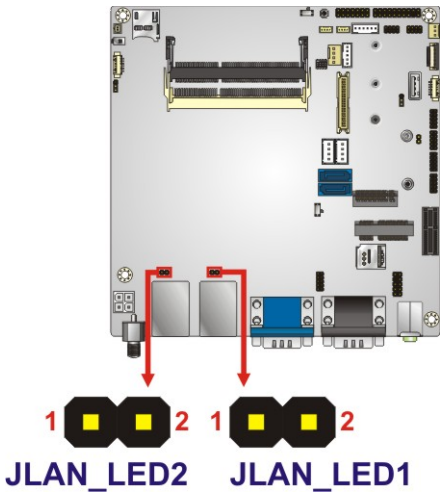


Figure 3-12: LAN LED Connector Locations

Pin	Description
1	LED+
2	LED-

Table 3-13: LAN LED Connector Pinouts

3.2.1 LCD Inverter Connector

CN Label: **INV1**

CN Type: 5-pin wafer, p=2.00 mm

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

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

Use the LCD inverter connector provides power to an LCD panel.

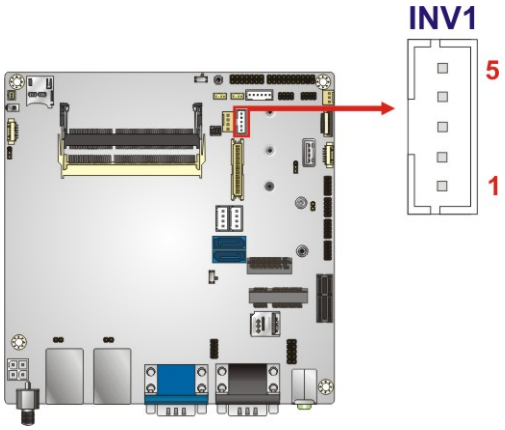


Figure 3-13: LCD Inverter Connector Location

Pin	Description
1	LCD Adjust
2	GND
3	+12V
4	GND
5	Backlight Enable

Table 3-14: LCD Inverter Connector Pinouts

3.2.1 LVDS Connector

CN Label: **LVDS1**

CN Type: 40-pin crimp

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

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

The LVDS connector is for connecting 18-bit/24-bit dual channel LVDS devices.

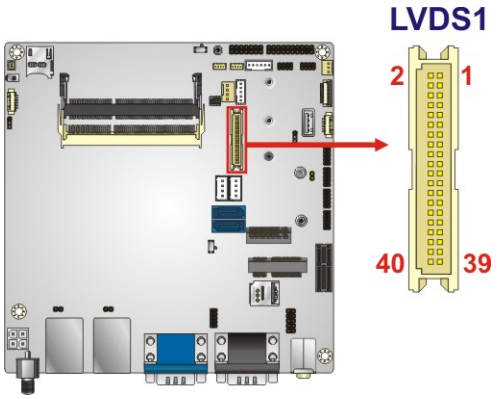


Figure 3-14: LVDS Connector Location

Pin	Description	Pin	Description
1	GND	2	GND
3	A_DATA0-	4	A_DATA1-
5	A_DATA0+	6	A_DATA1+
7	GND	8	GND
9	A_DATA2-	10	Clock1-
11	A_DATA2+	12	Clcok1+
13	GND	14	GND
15	A_DATA3-	16	A_DATA4-
17	A_DATA3+	18	A_DATA4+
19	GND	20	GND
21	A_DATA5-	22	A_DATA6-
23	A_DATA5+	24	A_DATA6+
25	GND	26	GND

Pin	Description	Pin	Description
27	Clock2-	28	A_DATA7-
29	Clcok2+	30	A_DATA7+
31	GND	32	GND
33	LVDS Detect (GND)*	34	GND
35	LCD VCC	36	LCD VCC
37	LCD VCC	38	LCD VCC
39	LCD VCC	40	LCD VCC

*LVDS Detect must be connected to GND.

Table 3-15: LVDS Connector Pinouts

3.2.2 M.2 Slot

CN Label: **M2_1**

CN Type: M.2 B-key slot

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

The M.2 slot is keyed in the B position and provides three positions for the mounting screw, accepting 2242, 2260 and 2280 sizes of M.2 modules. The M.2 slot supports SATA and USB 2.0 interfaces only.

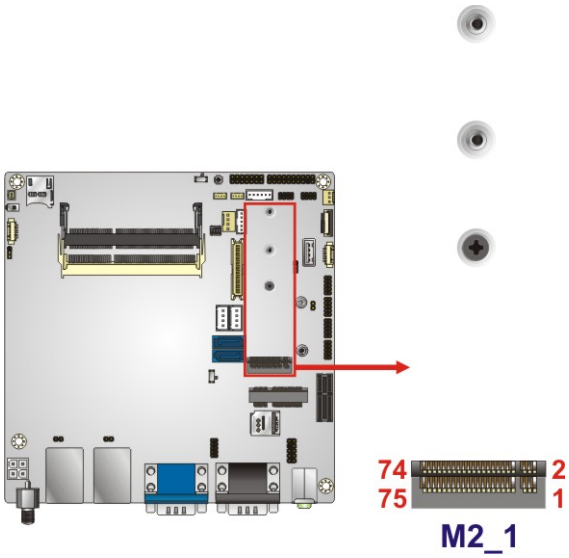


Figure 3-15: M.2 Slot Location

3.2.3 microSD Slot (Optional)

CN Label: **SD1**

CN Type: microSD card slot

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

The microSD card slot accepts a microSD card for storage.

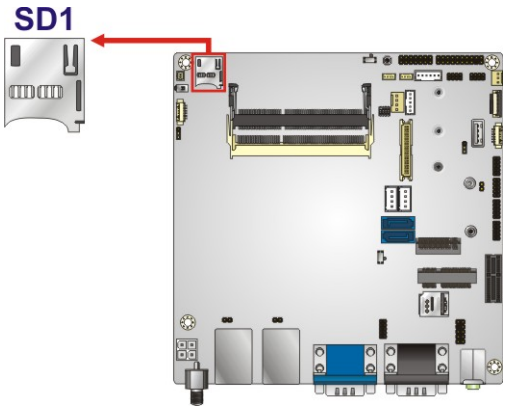


Figure 3-16: microSD Card Slot Location

3.2.4 PCIe Mini Card Slot

CN Label: **MPCIE1**

CN Type: Half-size/Full-size PCIe Mini card slot

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

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

The PCIe Mini card slot is for installing a full-size or half-size PCIe Mini expansion card.

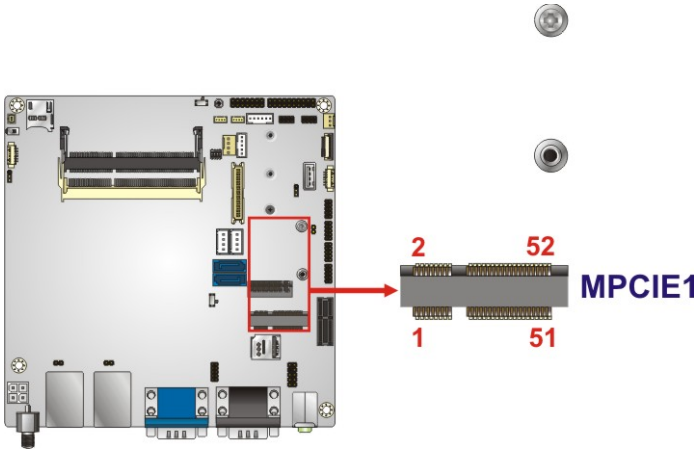


Figure 3-17: PCIe Mini Card Slot Location

Pin	Description	Pin	Description
1	PCIE_WAKE#	2	VCC3
3	N/C	4	GND
5	N/C	6	1.5 V
7	PCIE_CLKREQ#	8	SIM_VCC
9	GND	10	SIM_IO
11	CLK-	12	SIM_CLK
13	CLK+	14	SIM_RST
15	GND	16	SIM_VPP
17	N/C	18	GND
19	N/C	20	WLAN_EN
21	GND	22	BUF_PLT_RST#
23	PCIE_RXN3	24	VCC3A
25	PCIE_RXP3	26	GND
27	GND	28	1.5 V
29	GND	30	SMBCLK
31	PCIE_TXN3	32	SMBDATA
33	PCIE_TXP3	34	GND
35	GND	36	USB2-
37	GND	38	USB2+
39	VCC3	40	GND

Pin	Description	Pin	Description
41	VCC3	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 3-16: PCIe Mini Card Slot Pinouts

3.2.5 PCIe x1 Card Slot

CN Label: **PCIE1**

CN Type: PCIe x1 slot

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

CN Pinouts: See **Table 3-17**

The PCIe x1 slot is for PCIe x1 expansion cards.

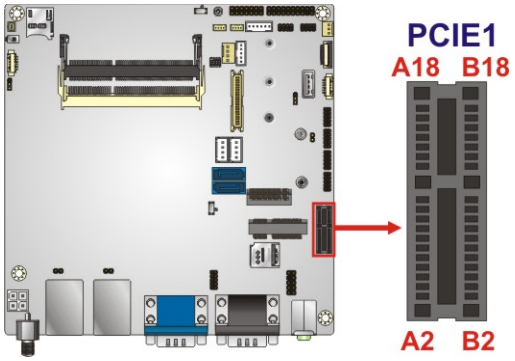


Figure 3-18: PCIe x1 Slot Location

Pin	Description	Pin	Description
A1	+12V	B1	PRSNT#1
A2	+12V	B2	+12V
A3	RSVD	B3	+12V
A4	GND	B4	GND
A5	SMCLK	B5	JTAG2

Pin	Description	Pin	Description
A6	SMDAT	B6	JTAG3
A7	GND	B7	JTAG4
A8	+3.3V	B8	JTAG5
A9	JTAG1	B9	+3.3V
A10	3.3 Vaux	B10	+3.3V
A11	WAKE#	B11	PWRGD
A12	RSVD	B12	GND
A13	GND	B13	REFCLK+
A14	HSOp(0)	B14	REFCLK-
A15	HSOn(0)	B15	GND
A16	GND	B16	HSIp(0)
A17	PRSNT#2	B17	HSIn(0)
A18	GND	B18	GND

Table 3-17: PCIe x1 Slot Pinouts

3.2.6 RS-232 Serial Port Connector

CN Label: **COM3, COM4, COM5, COM6**

CN Type: 10-pin header, p=2.00 mm

CN Location: See **Figure 3-19**

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

The serial connectors provide RS-232 connections.

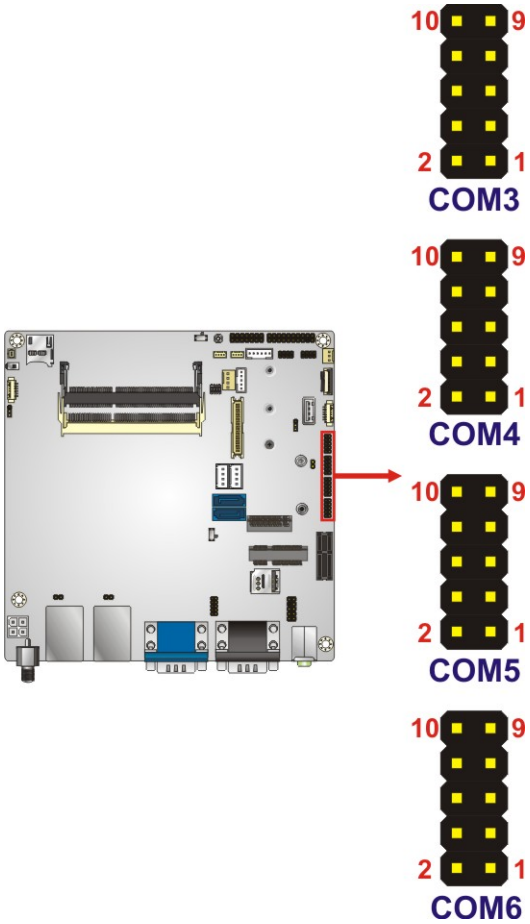


Figure 3-19: RS-232 Serial Port Connector Locations

Pin	Description	Pin	Description
1	DCD	2	DSR
3	RX	4	RTS
5	TX	6	CTS
7	DTR	8	RI
9	GND	10	GND

Table 3-18: RS-232 Serial Port Connector Pinouts

3.2.7 SATA 6Gb/s Drive Connectors

CAUTION:

If an M.2 module is installed in the M.2 slot (M2_1), the SATA port 2 (SATA2) will be disabled. Choose either the SATA2 connector or the M.2 module for storage.

CN Label:	**SATA1, SATA2**
CN Type:	7-pin SATA connector
CN Location:	See **Figure 3-20**

The SATA 6Gb/s drive connector is connected to a SATA 6Gb/s drive. The SATA 6Gb/s drive transfers data at speeds as high as 6Gb/s.

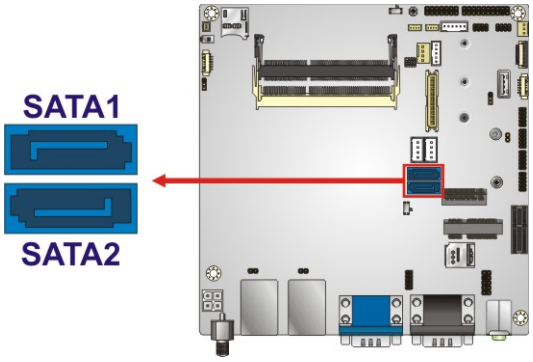


Figure 3-20: SATA 6Gb/s Drive Connectors Locations

3.2.8 SATA Power Connectors

CN Label: **SATA_PWR1, SATA_PWR2**

CN Type: 4-pin wafer, p=2.54 mm

CN Location: See **Figure 3-21**

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

The SATA power connector provides +5 V and +12 V power output to the SATA connector.

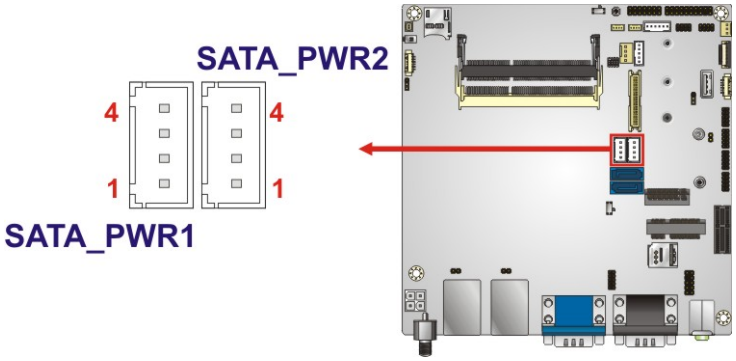


Figure 3-21: SATA Power Connector Locations

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

Table 3-19: SATA Power Connector Pinouts

3.2.9 SIM Card Slot (Optional)

CN Label: **SIM1**

CN Type: micro-SIM card slot

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

The SIM card slot accepts a SIM card for 3G network communication.

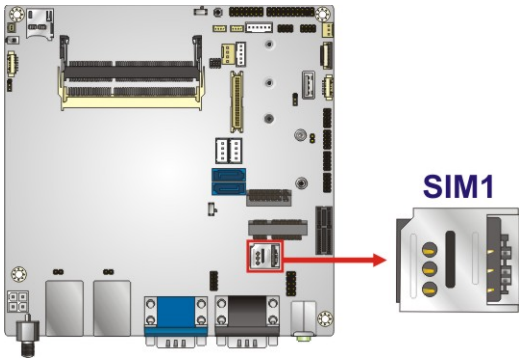


Figure 3-22: SIM Card Slot Location

3.2.1 SMBus Connector

CN Label: **J_SMB1**

CN Type: 4-pin wafer, p=1.25 mm

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

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

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

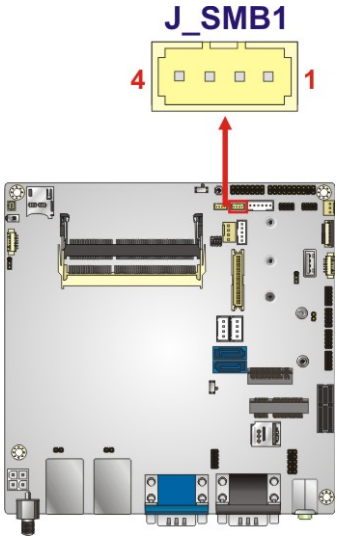


Figure 3-23: SMBus Connector Location

Pin	Description
1	GND
2	SMB_DATA
3	SMB_CLK
4	+5V

Table 3-20: SMBus Connector Pinouts

3.2.2 SPI Flash Connector, BIOS

CN Label: **J_SPI1**

CN Type: 6-pin wafer, p=1.25 mm

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

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

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

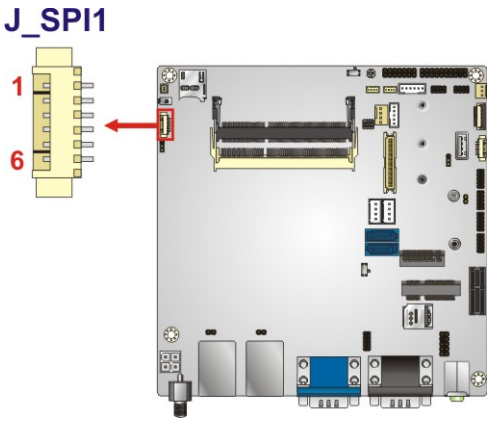


Figure 3-24: BIOS SPI Flash Connector Location

Pin	Description
1	+3.3V
2	CS#
3	MISO
4	Clock
5	MOSI
6	GND

Table 3-21: BIOS SPI Flash Connector Pinouts

3.2.1 SPI Flash Connector, EC

CN Label: **J_EC1**

CN Type: 6-pin wafer, p=1.25 mm

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

CN Pinouts: See **Table 3-22**

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

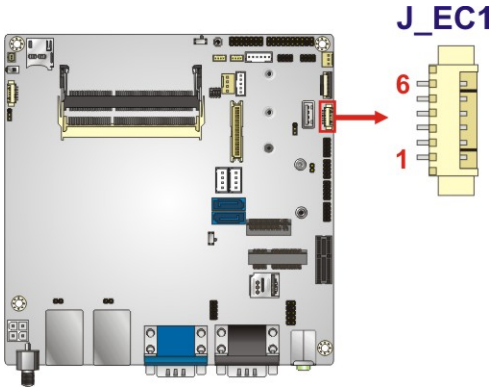


Figure 3-25: EC SPI Flash Connector Location

Pin	Description
1	+3.3V
2	CS#
3	MISO
4	Clock
5	MOSI
6	GND

Table 3-22: EC SPI Flash Connector Pinouts

3.2.2 TPM Connector

CN Label: **TPM1**

CN Type: 20-pin header, p=2.54 mm

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

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

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

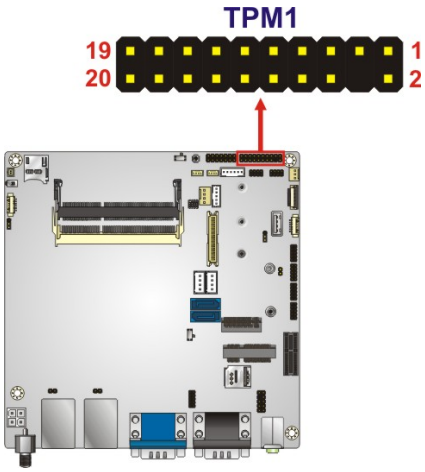


Figure 3-26: TPM Connector Location

Pin	Description	Pin	Description
1	Clock	2	GND
3	LFRAME#	4	Serial IRQ
5	LPC Reset	6	LAD2
7	LAD3	8	LAD1
9	+3.3V	10	LPC Reset
11	LAD0	12	GND
13	SCL	14	SDA
15	SB3V	16	SERIRQ
17	GND	18	CLKRUN#
19	LPCPD#	20	LDRQ#

Table 3-23: TPM Connector Pinouts

3.2.3 USB Connectors

CN Label: **USB1, USB2**

CN Type: 8-pin header, p=2.00 mm

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

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

The USB connectors provide four USB 2.0 ports by dual-port USB cable.

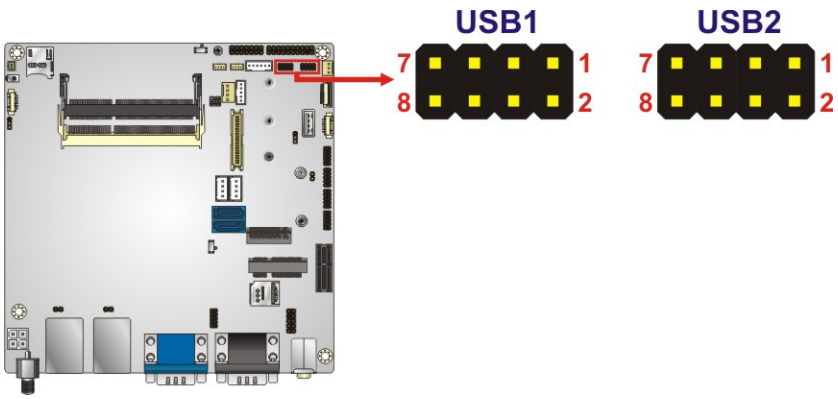


Figure 3-27: USB Connector Locations

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

Table 3-24: USB Connector Pinouts

3.3 External Peripheral Interface Connector Panel

Figure 3-28 shows the KINO-DAL external peripheral interface connector (EPIC) panel. The EPIC panel consists of the following:

- 2 x Audio jack (AUDIO1)
- 1 x DC-in power jack (PWR1)
- 2 x GbE connector (LAN1, LAN2)

- 1 x HDMI connector (HDMI1)
- 2 x RS-232/422/485 serial port (COM1, COM2)
- 4 x USB 3.0 connector (USB01, USB23)
- 1 x VGA connector (VGA1)

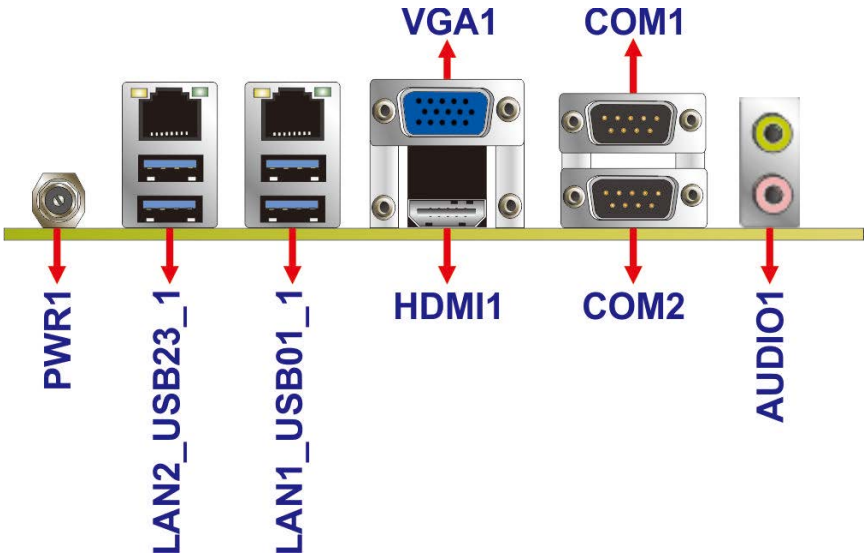


Figure 3-28: External Peripheral Interface Connector

3.3.1 Audio Jacks

CN Label: **AUDIO1**

CN Type: Audio jack

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

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 3-29: Audio Connector

3.3.1 HDMI Connector

CN Label: **HDMI1**

CN Type: 23-pin HDMI port

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

CN Pinouts: See **Figure 3-30** and **Table 3-25**

The HDMI connector can connect to an HDMI device.

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

Table 3-25: HDMI Connector Pinouts

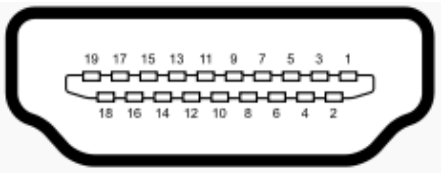


Figure 3-30: HDMI Connector

3.3.2 LAN & USB 3.0 Combo Connectors

CN Label: **LAN1_USB01_1, LAN2_USB23_1**

CN Type: RJ-45, USB 3.0

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

The LAN connector connects to a local network.

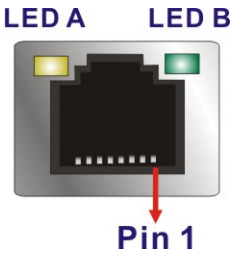


Figure 3-31: LAN Connector

Pin	Description	Pin	Description
1	MDIA0+	5	MDIA2-
2	MDIA0-	6	MDIA1-
3	MDIA1+	7	MDIA3+
4	MDIA2+	8	MDIA3-

Table 3-26: LAN Pinouts

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

Table 3-27: Connector LEDs

The USB connector can be connected to a USB 2.0 or USB 3.0 device. The pinouts of USB 3.0 connectors are shown below.

Pin	Description	Pin	Description
1	USB_VCC	10	USB_VCC
2	USB2_D0-	11	USB2_D0-
3	USB2_D0+	12	USB2P0_D0+

Pin	Description	Pin	Description
4	GND	13	GND
5	USB3P0_RXDN1	14	USB3P0_RXDN2
6	USB3P0_RXDP1	15	USB3P0_RXDP2
7	GND	16	GND
8	USB3P0_TXDN1	17	USB3P0_TXDN2
9	USB3P0_TXDP1	18	USB3P0_TXDP2

Table 3-28: USB 3.0 Port Pinouts

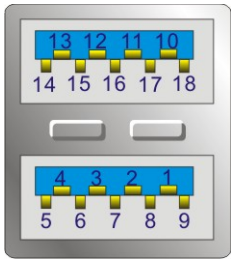


Figure 3-32: USB 3.0 Port Pinout Locations

3.3.3 Power Connector

CN Label: **PWR1**

CN Type: Power jack

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

The power connector supports a power adapter. The input voltage varies by models:

- 12 V DC: KINO-DAL-N2
  KINO-DAL-N1
- 9 V ~ 30 V DC: KINO-DAL-E3W2
  KINO-DAL-E2W2
  KINO-DAL-E1W2

Figure 3-33: Power Jack

3.3.1 RS-232/422/485 Serial Port Connectors (COM1, COM2)

CN Label: **COM1, COM2**

CN Type: DB-9 connector

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

CN Pinouts: See **Figure 3-34** and **Table 3-29**

These two connectors provide RS-232, RS-422 or RS-485 communications. The default mode is set to RS-232 by BIOS configuration. To configure the connectors as RS-422 or RS-485, please refer to **Section 5.3.2.1.1** and **Section 5.3.2.1.2**.

Pin	RS-232	RS-422	RS-485
1	DCD	TXD422-	TXD485-
2	RX	TXD422+	TXD485+
3	TX	RXD422+	
4	DTR	RXD422-	
5	GND	GND	GND
6	DSR		
7	RTS		
8	CTS		
9	RI		

Table 3-29: RS-232/422/485 Serial Port Pinouts

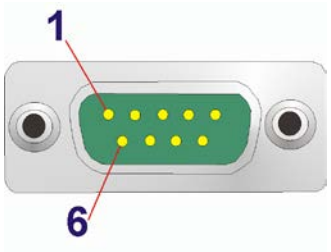


Figure 3-34: Serial Port Pinouts

3.3.1 VGA Connector

CN Label: **VGA1**

CN Type: 15-pin Female

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

CN Pinouts: See **Figure 3-35** and **Table 3-30**

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

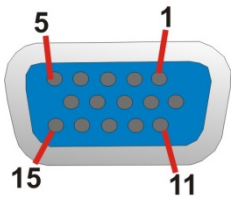


Figure 3-35: VGA Connector

Pin	Description	Pin	Description
1	RED	2	GREEN
3	BLUE	4	NC
5	GND	6	GND
7	GND	8	GND
9	VCC / NC	10	GND
11	NC	12	DDC DAT
13	HSYNC	14	VSYNC
15	DDCCLK		

Table 3-30: VGA Connector Pinouts

Chapter

4

Installation

4.1 Anti-static Precautions

WARNING:

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

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the KINO-DAL. Dry climates are especially susceptible to ESD. It is therefore critical that whenever the KINO-DAL 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-DAL, place it on an anti-static pad. This reduces the possibility of ESD damaging the KINO-DAL.
- ***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 installation. All installation notices must be strictly adhered to. Failing to adhere to these precautions may lead to severe damage and injury to the person performing the installation.

WARNING:

The installation instructions described in this manual should be carefully followed in order to prevent damage to the KINO-DAL, KINO-DAL 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-DAL 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-DAL 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-DAL off:
  - When working with the KINO-DAL, 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-DAL **DO NOT:**

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

4.3 SO-DIMM Installation

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

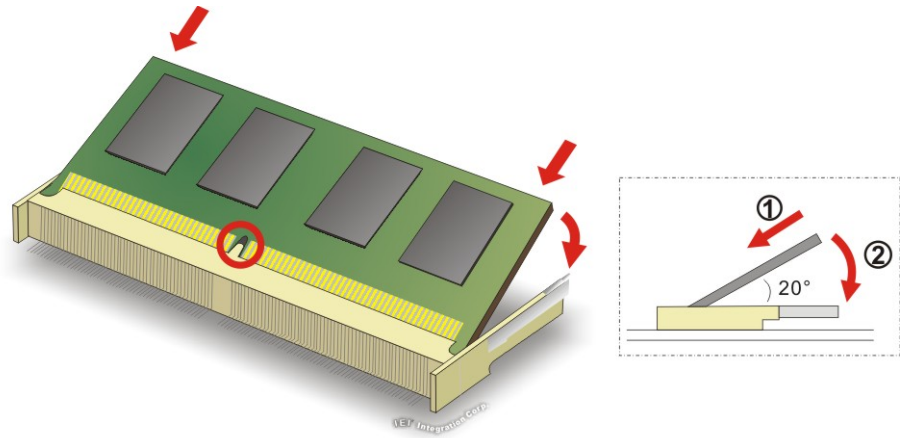


Figure 4-1: SO-DIMM Installation

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 20º angle. (See **Figure 4-1**)

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

CAUTION:

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

4.4 M.2 Module Installation

CAUTION:

If an M.2 module is installed in the M.2 slot (M2_1), the SATA port 2 (SATA2) will be disabled. Choose either the SATA2 connector or the M.2 module for storage.

To install an M.2 module, please follow the steps below.

Step 1: Locate the M.2 module slot. See **Chapter 3**.

Step 2: Remove the on-board retention screw and the plastic ring as shown in **Figure 4-2**.

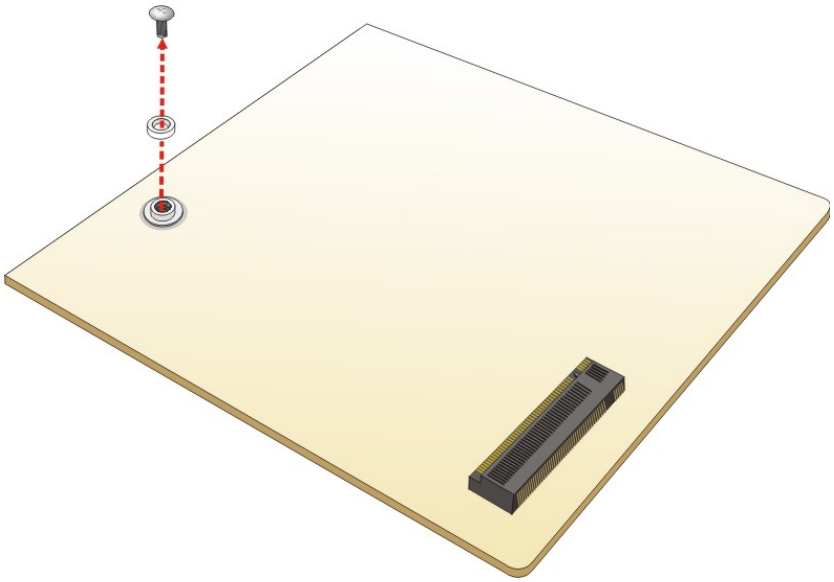


Figure 4-2: Removing the M.2 Module Retention Screw and Plastic Ring

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

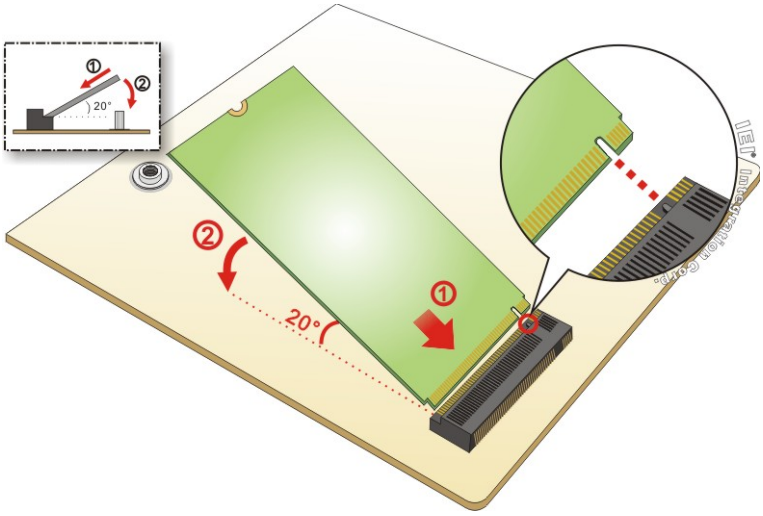


Figure 4-3: Inserting the M.2 Module into the Slot at an Angle

Step 4: Put the plastic ring onto the screw holes. Push the M.2 module down and secure it with the previously removed retention screw (**Figure 4-4**).

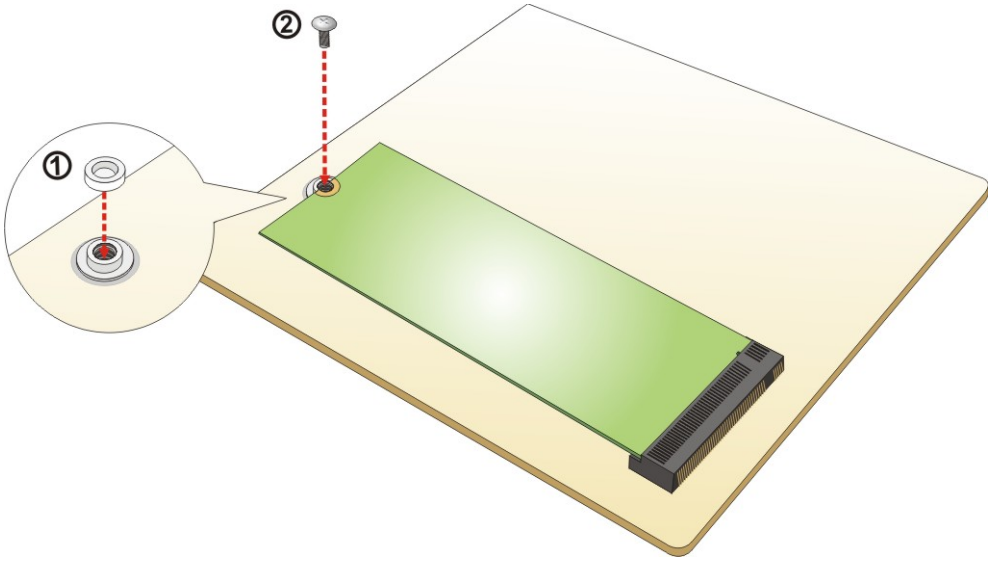


Figure 4-4: Securing the M.2 Module

4.5 PCIe Mini Card Installation

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

4.5.1 Full-size PCIe Mini Card Installation

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

Step 1: Locate the PCIe Mini card slot. See **Chapter 3**.

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

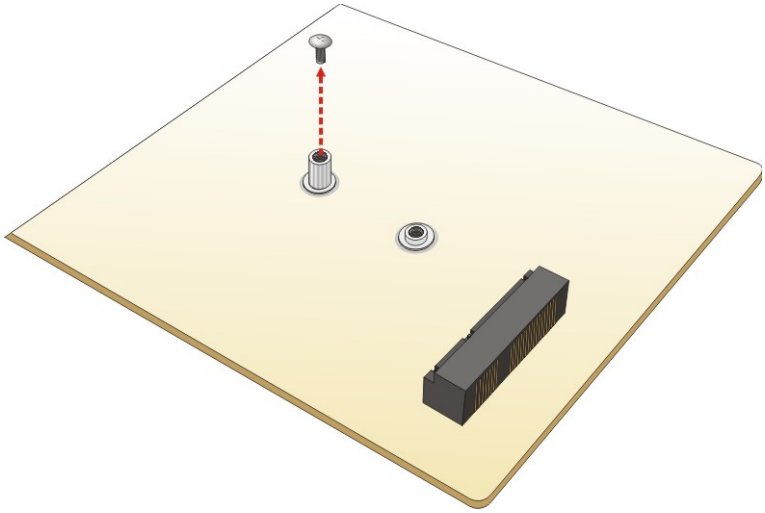


Figure 4-5: Removing the Retention Screw

Step 3: Line up the notch on the card with the notch on the slot. Slide the PCIe Mini card into the socket at an angle of about 20º (**Figure 4-6**).

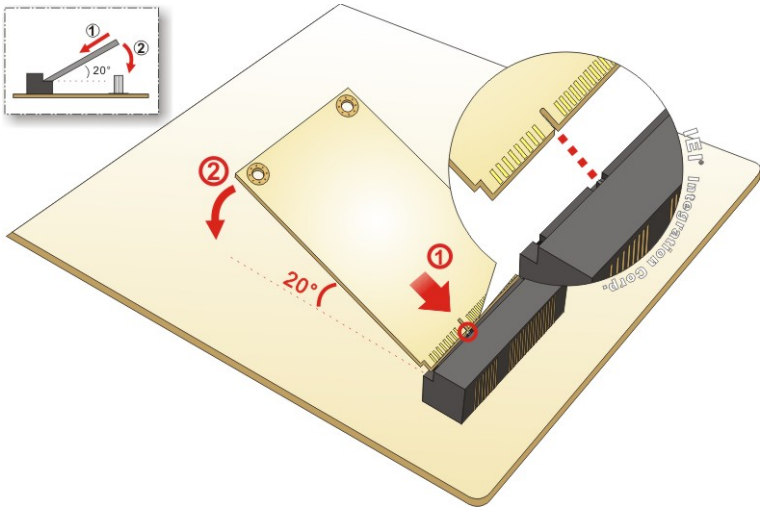


Figure 4-6: Inserting the Full-size PCIe Mini Card into the Slot at an Angle

Step 4: Secure the full-size PCIe Mini card with the retention screw previously removed (**Figure 4-7**).

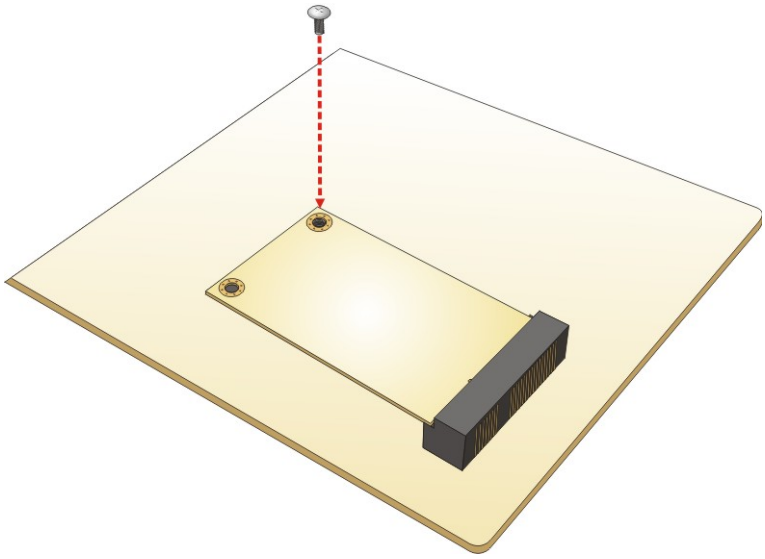


Figure 4-7: Securing the Full-size PCIe Mini Card

4.5.2 Half-size PCIe Mini Card Installation

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

Step 1: Locate the PCIe Mini card slot. See **Chapter 3**.

Step 2: Remove the retention screw first, then unscrew and remove the standoff secured on the motherboard. See **Figure 4-8**.

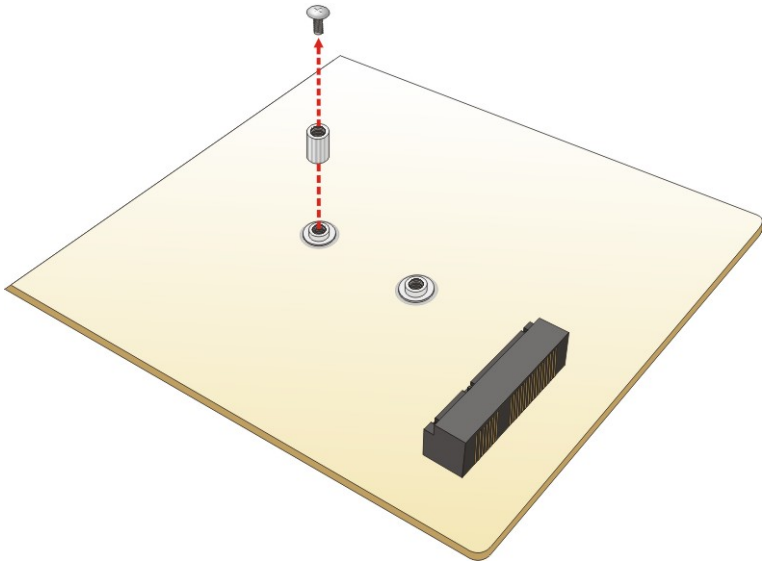


Figure 4-8: Removing Retention Screw and Standoff

Step 3: Install the previously removed standoff to the screw hole for the half-size PCIe Mini card (**Figure 4-9**).

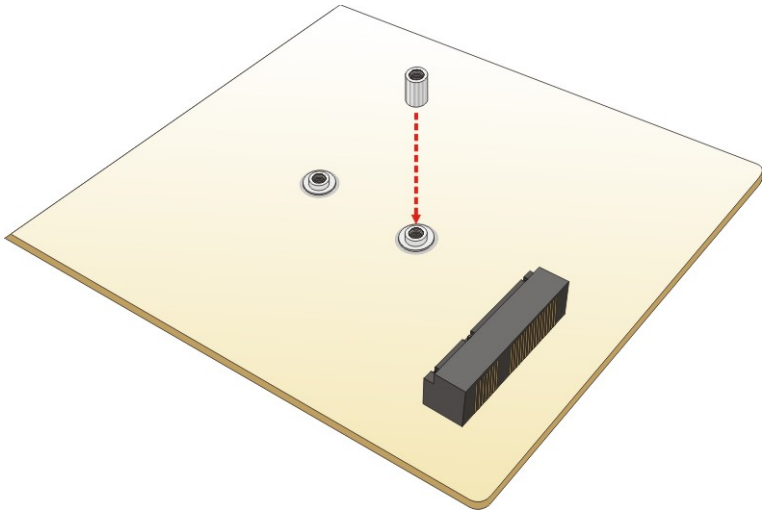


Figure 4-9: Installing the Standoff

Step 4: Line up the notch on the card with the notch on the slot. Slide the PCIe Mini card into the slot at an angle of about 20º (**Figure 4-10**).

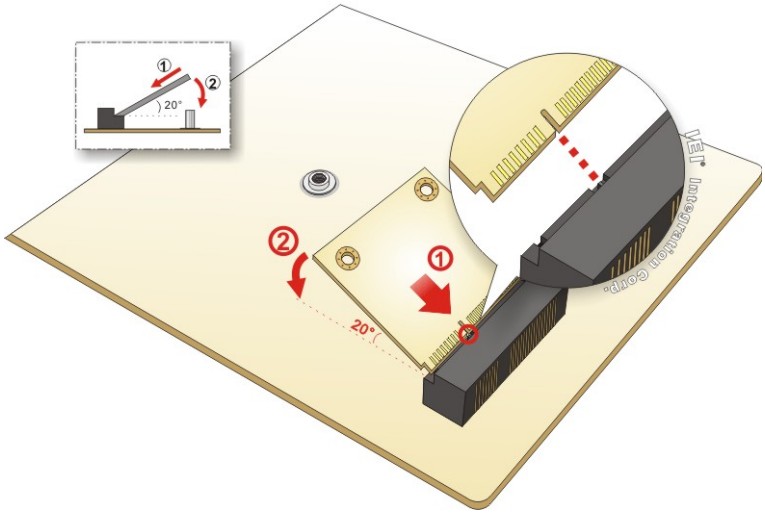


Figure 4-10: Inserting the Half-size PCIe Mini Card into the Slot at an Angle

Step 5: Secure the half-size PCIe Mini card with the retention screw previously removed (**Figure 4-11**).

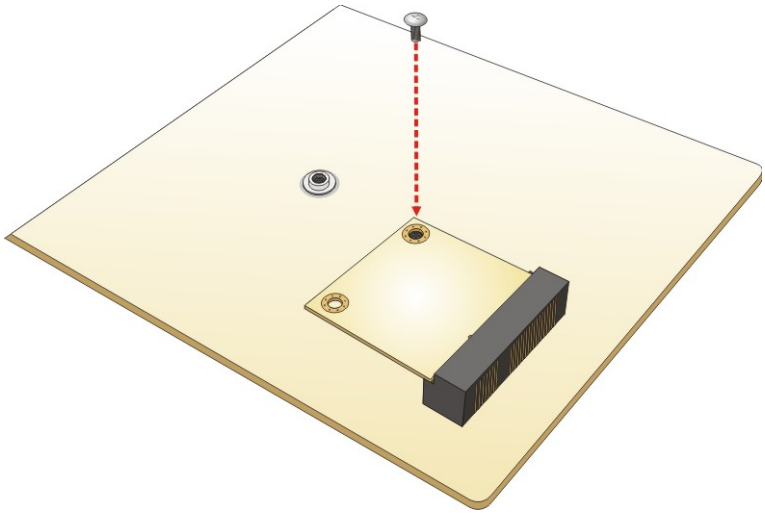


Figure 4-11: Securing the Half-size PCIe Mini Card

4.6 SIM Card Installation (Optional)

To install a SIM card, please follow the steps below.

Step 1: Locate the SIM card slot. See **Section 3.2.9**.

Step 2: Unlock the SIM card slot cover by sliding the cover in the direction as shown by the arrow in **Figure 4-12**.

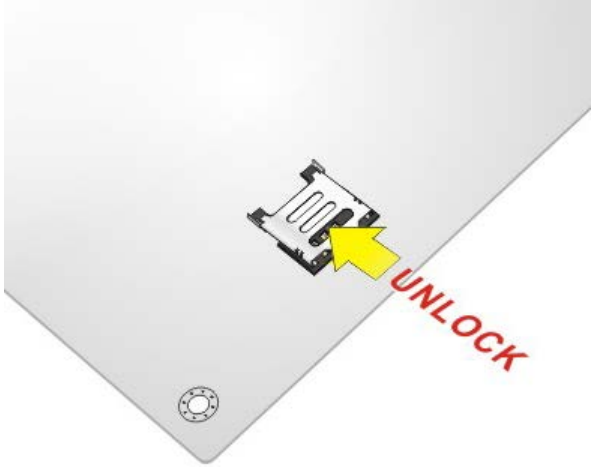


Figure 4-12: Unlock SIM Card Slot Cover

Step 3: Open the slot cover and place a SIM card onto the slot. The cut mark on the corner should be facing away from the slot as shown in **Figure 4-13**.

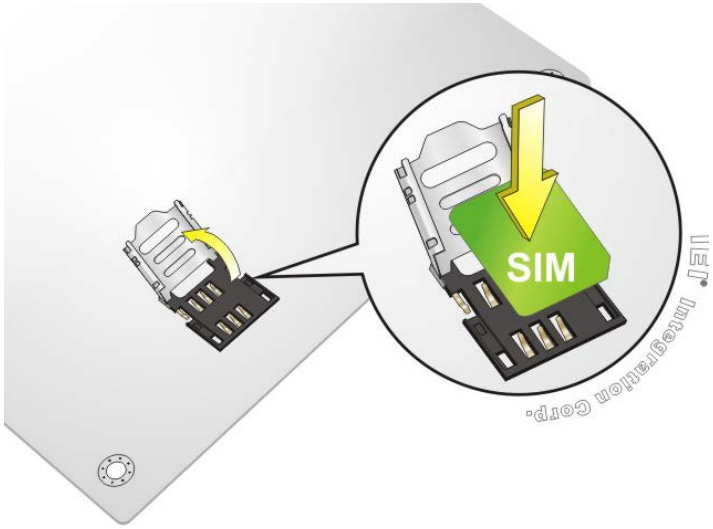


Figure 4-13: SIM Card Installation

Step 4: Close the slot cover and lock it by sliding it in the direction as shown by the arrow in **Figure 4-14**.

Figure 4-14: Lock SIM Card Slot Cover

4.7 System Configuration

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

4.7.1 AT/ATX Mode Select Switch

The AT/ATX mode select switch (SW_A/T1) specifies the systems power mode as AT or ATX. AT/ATX mode select switch settings are shown in **Table 4-1**.

Setting	Description
Short A-B	ATX Mode (Default)
Short B-C	AT Mode

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

The location of the AT/ATX mode select switch is shown in **Figure 4-15** below.

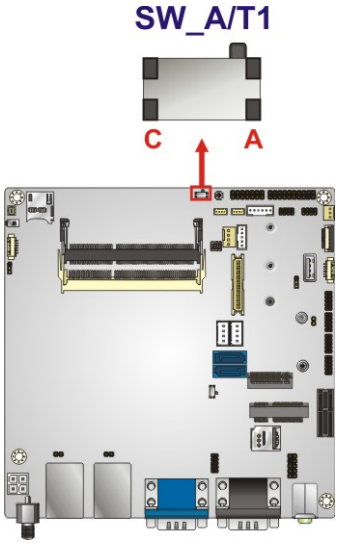


Figure 4-15: AT/ATX Mode Select Switch Location

4.7.2 Clear CMOS Button

If the KINO-DAL fails to boot due to improper BIOS settings, use the button to clear the CMOS data and reset the system BIOS information.

The location of the clear CMOS button (J_CMOS1) is shown in **Figure 4-16**

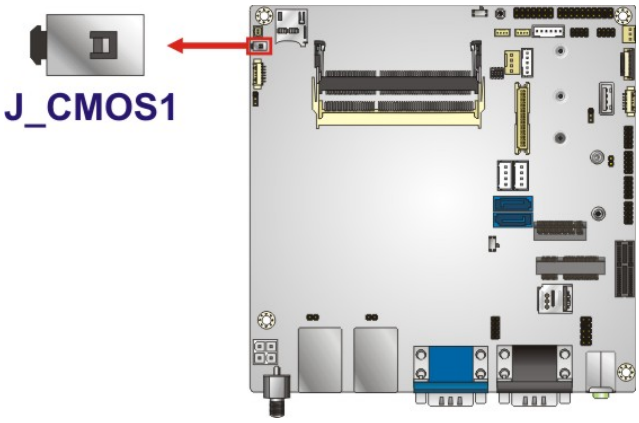


Figure 4-16: Clear CMOS Button Location

4.7.3 Flash Descriptor Security Override Jumper

The Flash Descriptor Security Override jumper (TXE_OV1, p=2.00 mm) allows users to enable or disable the ME firmware update. Refer to **Figure 4-17** and **Table 4-2** for the jumper location and settings.

Setting	Description
Short 1-2	Disabled (default)
Short 2-3	Enabled

Table 4-2: Flash Descriptor Security Override Jumper Settings

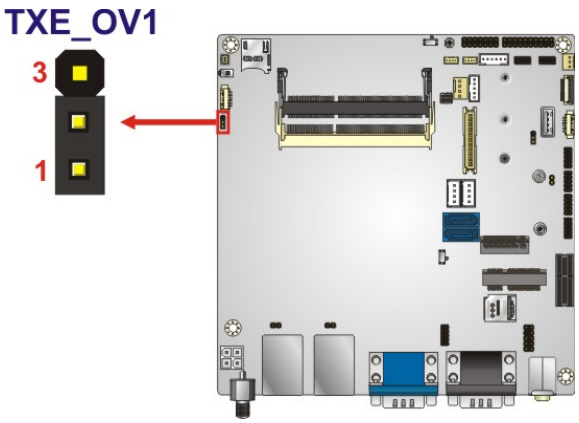


Figure 4-17: Flash Descriptor Security Override Jumper Location

To update the ME firmware, please follow the steps below.

Step 1: Before turning on the system power, short pin 2~3 of the Flash Descriptor Security Override jumper.

Step 2: Update the BIOS and ME firmware, and then turn off the system power.

Step 3: Remove the metal clip on the Flash Descriptor Security Override jumper to its default setting (short 1~2).

Step 4: Restart the system. The system will reboot 2 ~ 3 times to complete the ME firmware update.

4.7.1 LVDS Voltage Select Jumper

WARNING:

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

The LVDS voltage selection jumper (J_PW1, p=2.00 mm) allows setting the voltage provided to the monitor connected to the LVDS connector. Refer to **Figure 4-18** and **Table 4-3** for the jumper location and settings.

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

Table 4-3: LVDS Voltage Select Jumper Settings

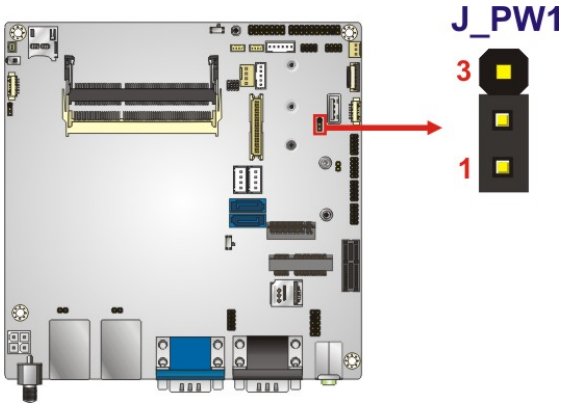


Figure 4-18: LVDS Voltage Select Jumper Location

4.7.2 LVDS Panel Resolution Select Switch

The SW1 selects the resolution of the LCD panel connected to the LVDS connector. Refer to **Figure 4-19** and **Table 4-4** for the jumper location and settings.

* ON=0, OFF=1

SW1 (4-3-2-1)	Description
0000	800x600 18-bit (default)
0001	1024x768 18-bit
0010	1024x768 24-bit
0011	1280x768 18-bit
0100	1280x800 18-bit
0101	1280x960 18-bit
0110	1280x1024 48-bit
0111	1366x768 18-bit
1000	1366x768 24-bit
1001	1440x960 48-bit
1010	1400x1050 48-bit
1011	1600x900 24-bit
1100	1680x1050 48-bit
1101	1600x1200 48-bit
1110	1920x1080 48-bit
1111	1920x1200 48-bit

Table 4-4: LVDS Panel Resolution Selection

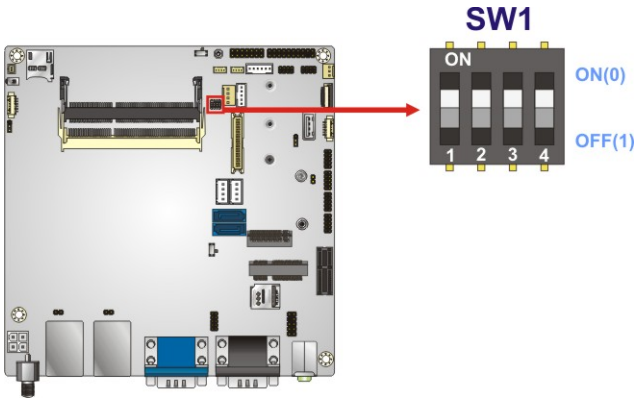


Figure 4-19: LVDS Panel Resolution Select Switch Location

4.7.3 M.2 and SATA2 Select Switch

Use the M.2 and SATA2 select switch (J_SATA1) to set the priority of M2_1 and SATA2 connectors since the M.2 (M2_1) slot is co-lay with the SATA2 connector. The M.2 and SATA2 select switch settings are shown in **Table 4-5**.

Setting	Description
Short A-B	Automatically detect M.2 or SATA2 (Default) (SATA2 will be disabled if an M.2 module is installed in the M2_1 slot; vice versa)
Short B-C	M2_1 is enabled and SATA2 is disabled.

Table 4-5: M.2 and SATA2 Select Switch Settings

The location of the M.2 and SATA2 select switch is shown in **Figure 4-20** below.

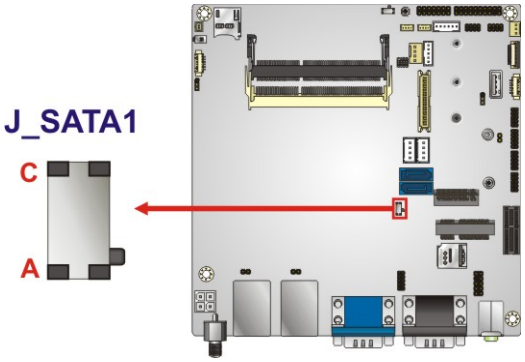


Figure 4-20: M.2 and SATA2 Select Switch Location

4.8 Chassis Installation

4.8.1 Airflow

WARNING:

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

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

4.8.2 Motherboard Installation

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

4.9 SATA Drive Connection

The KINO-DAL is shipped with a SATA drive cable. To connect the SATA drive to the connector, please follow the steps below.

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

Step 2: **Insert the cable connector**. Insert the cable connector into the on-board SATA drive connector and the SATA power connector. See **Figure 4-21**.

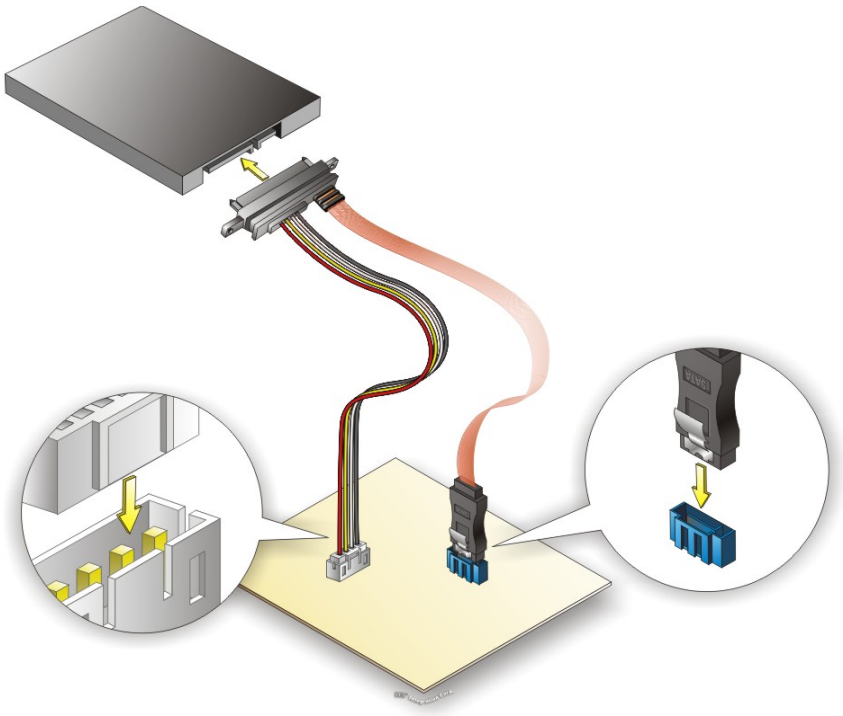


Figure 4-21: SATA Drive Cable Connection

NOTE:

The connector locations in the diagram above are just for reference. For the exact locations, please see **Section 3.2.7** and **3.2.8**.

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 4-21**.

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

Chapter

5

BIOS

5.1 Introduction

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

NOTE:

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

5.1.1 Starting Setup

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

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

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

5.1.2 Using Setup

Use the arrow keys to highlight items, press **ENTER** to select, use the PageUp and PageDown keys to change entries, press **F1** for help and press **ESC** to quit. Navigation keys are shown in Table 5-1.

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

Key	Function
-	Decrease the numeric value or make changes
F1 key	General help, only for Status Page Setup Menu and Option Page Setup Menu
F2 key	Load previous values.
F3 key	Load optimized defaults
F4 key	Save changes and Exit BIOS
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 **Section 4.7.2**.

5.1.5 BIOS Menu Bar

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

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

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) 2017 American Megatrends, Inc.
  Main    Advanced   Chipset   Security    Boot    Save & Exit

BIOS Information                                  Set the Date. Use Tab to
BIOS Vendor                    American Megatrends switch between Data
Core Version                   5.12                elements.
Compliency                     UEFI 2.5; PI 1.4
Project Version                B404AT12.BIN
Build Date and Time            11/17/2017 13:32:39

iWDD Vendor                    iEi
iWDD Version                   B404ET13.bin

Platform firmware Information
BXT SOC                        B1
MRC Version                    0.56
PUNIT FW                       28                  ---------------------
PMC FW                         03.28
TXE FW                         3.0.12.1138         ←→: Select Screen
ISH FW                         4.1.0.3364          ↑ ↓: Select Item
GOP                            0.0.0036            EnterSelect
                                                   +/-: Change Opt.
Memory Information                                 F1:  General Help
Total Memory                   2048 MB             F2:  Previous Values
Memory Speed                   1600 MHz            F3:  Optimized Defaults
                                                   F4:  Save & Exit
System Date                    [Fri 01/01/2010]    ESC: Exit
System Time                    [00:18:35]

      Version 2.18.1263. Copyright (C) 2017 American Megatrends, Inc.
```

BIOS Menu 1: Main

➔ **System Date [xx/xx/xx]**

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

➔ **System Time [xx:xx:xx]**

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

5.3 Advanced

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

WARNING!

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

```
      Aptio Setup Utility – Copyright (C) 2017 American Megatrends, Inc.
  Main    Advanced  Chipset   Security    Boot    Save & Exit

> ACPI Settings                                   System ACPI Parameters.
> F81866 Super IO Configuration
> iWDD H/W Monitor
> USB Configuration
> CPU Configuration                               ----------------------
> RTC Wake Settings                               ←→: Select Screen
> Power Saving Configuration                      ↑ ↓: Select Item
> Serial Port Console Redirection                 EnterSelect
> iEi Feature                                     F1   General Help
                                                  F2   Previous Values
                                                  F3   Optimized Defaults
                                                  F4   Save
                                                  ESC  Exit
        Version 2.18.1263. Copyright (C) 2017 American Megatrends, Inc.
```

BIOS Menu 2: Advanced

5.3.1 ACPI Settings

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

```
Aptio Setup Utility – Copyright (C) 2017 American Megatrends, Inc.
Advanced

ACPI Settings

ACPI Sleep State                    [S3 (Suspend to RAM]

                                    ----------------------

                                    ←→: Select Screen
                                    ↑ ↓: Select Item
                                    EnterSelect
                                    +/-: Change Opt.
                                    F1:  General Help
                                    F2:  Previous Values
                                    F3:  Optimized Defaults
                                    F4:  Save & Exit
                                    ESC: Exit
Version 2.18.1263. Copyright (C) 2017 American Megatrends, Inc.
```

BIOS Menu 3: ACPI Settings

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

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

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

5.3.2 F81866 Super IO Configuration

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

```
Aptio Setup Utility – Copyright (C) 2017 American Megatrends, Inc.
Advanced

F81866 Super IO Configuration                    Set Parameters of Serial
                                                 Port 1 (COMA)
Super IO Chip                    F81866
> Serial Port 1 Configuration                    ---------------------
> Serial Port 2 Configuration                    ←→: Select Screen
> Serial Port 3 Configuration                    ↑ ↓: Select Item
> Serial Port 4 Configuration                    EnterSelect
> Serial Port 5 Configuration                    F1   General Help
> Serial Port 6 Configuration                    F2   Previous Values
                                                 F3    Optimized
                                                 Defaults
                                                 F4    Save
                                                 ESC   Exit
Version 2.18.1263. Copyright (C) 2017 American Megatrends, Inc.
```

BIOS Menu 4: F81866 Super IO Configuration

5.3.2.1 Serial Port n Configuration

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

```
Aptio Setup Utility – Copyright (C) 2017 American Megatrends, Inc.
Advanced

Serial Port 1 Configuration                      Enable or Disable Serial
                                                 Port (COM)
Serial Port                      [Enabled]
Device Settings                  IO=3F8h; IRQ=4
                                                 ---------------------
Change Settings                  [IO=3F8h; IRQ=4;]  ←→: Select Screen
Transfer Mode                    [RS232]            ↑ ↓: Select Item
                                                 EnterSelect
                                                 F1   General Help
                                                 F2   Previous Values
                                                 F3    Optimized
                                                 Defaults
                                                 F4    Save
                                                 ESC   Exit
Version 2.18.1263. Copyright (C) 2017 American Megatrends, Inc.
```

BIOS Menu 5: Serial Port n Configuration

5.3.2.1.1 Serial Port 1 Configuration

➔ **Serial Port [Enabled]**

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

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

➔ **Change Settings [IO=3F8h; IRQ=4]**

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

➔ **IO=3F8h; IRQ=4**	**DEFAULT**	Serial Port I/O port address is 3F8h and the interrupt address is IRQ4
➔ **IO=3F8h; IRQ=4, 10, 11**		Serial Port I/O port address is 3F8h and the interrupt address is IRQ4, 10, 11
➔ **IO=2F8h; IRQ=4, 10, 11**		Serial Port I/O port address is 2F8h and the interrupt address is IRQ4, 10, 11
➔ **IO=3E8h; IRQ=4, 10, 11**		Serial Port I/O port address is 3E8h and the interrupt address is IRQ4, 10, 11
➔ **IO=2E8h; IRQ=4, 10, 11**		Serial Port I/O port address is 2E8h and the interrupt address is IRQ4, 10, 11

➔ **Transfer Mode [RS232]**

Use the **Transfer Mode** option to select the Serial Port 1 signaling mode.

➔ **RS422**		Serial Port 6 signaling mode is RS-422
➔ **RS232**	**DEFAULT**	Serial Port 6 signaling mode is RS-232
➔ **RS485**		Serial Port 6 signaling mode is RS-485

5.3.2.1.2 Serial Port 2 Configuration

➔ **Serial Port [Enabled]**

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

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

➔ **Change Settings [IO=2F8h; IRQ=11]**

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

➔ **IO=2F8h; IRQ=11**	**DEFAULT**	Serial Port I/O port address is 2F8h and the interrupt address is IRQ11
➔ **IO=3F8h; IRQ=4, 10, 11**		Serial Port I/O port address is 3F8h and the interrupt address is IRQ4, 10, 11
➔ **IO=2F8h; IRQ=4, 10, 11**		Serial Port I/O port address is 2F8h and the interrupt address is IRQ4, 10, 11
➔ **IO=3E8h; IRQ=4, 10, 11**		Serial Port I/O port address is 3E8h and the interrupt address is IRQ4, 10, 11
➔ **IO=2E8h; IRQ=4, 10, 11**		Serial Port I/O port address is 2E8h and the interrupt address is IRQ4, 10, 11

➔ **Transfer Mode [RS232]**

Use the **Transfer Mode** option to select the Serial Port 2 signaling mode.

➔ **RS422**		Serial Port 6 signaling mode is RS-422
➔ **RS232**	**DEFAULT**	Serial Port 6 signaling mode is RS-232
➔ **RS485**		Serial Port 6 signaling mode is RS-485

5.3.2.1.3 Serial Port 3 Configuration

➔ **Serial Port [Enabled]**

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

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

➔ **Change Settings [IO=3E8h; IRQ=10]**

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

➔ **IO=3E8h; IRQ=10**	**DEFAULT**	Serial Port I/O port address is 3E8h and the interrupt address is IRQ10
➔ **IO=3E8h; IRQ=4, 10, 11**		Serial Port I/O port address is 3E8h and the interrupt address is IRQ4, 10, 11
➔ **IO=2E8h; IRQ=4, 10, 11**		Serial Port I/O port address is 2E8h and the interrupt address is IRQ4, 10, 11
➔ **IO=3E0h; IRQ=4, 10, 11**		Serial Port I/O port address is 3E0h and the interrupt address is IRQ4, 10, 11
➔ **IO=2E0h; IRQ=4, 10, 11**		Serial Port I/O port address is 2E0h and the interrupt address is IRQ4, 10, 11

5.3.2.1.4 Serial Port 4 Configuration

➔ **Serial Port [Enabled]**

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

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

➔ **Change Settings [IO=2E8h; IRQ=10]**

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

➔ **IO=2E8h; IRQ=10**	**DEFAULT**	Serial Port I/O port address is 2E8h and the interrupt address is IRQ10
➔ **IO=3E8h; IRQ=4, 10, 11**		Serial Port I/O port address is 3E8h and the interrupt address is IRQ4, 10, 11
➔ **IO=2E8h; IRQ=4, 10, 11**		Serial Port I/O port address is 2E8h and the interrupt address is IRQ4, 10, 11
➔ **IO=3E0h; IRQ=4, 10, 11**		Serial Port I/O port address is 3E0h and the interrupt address is IRQ4, 10, 11
➔ **IO=2E0h; IRQ=4, 10, 11**		Serial Port I/O port address is 2E0h and the interrupt address is IRQ4, 10, 11

5.3.2.1.5 Serial Port 5 Configuration

➔ **Serial Port [Enabled]**

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

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

➔ **Change Settings [IO=3E0h; IRQ=10]**

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

➔ **IO=3E0h; IRQ=10**	**DEFAULT**	Serial Port I/O port address is 3E0h and the interrupt address is IRQ10
➔ **IO=3E8h; IRQ=4, 10, 11**		Serial Port I/O port address is 3E8h and the interrupt address is IRQ4, 10, 11
➔ **IO=2E8h; IRQ=4, 10, 11**		Serial Port I/O port address is 2E8h and the interrupt address is IRQ4, 10, 11
➔ **IO=3E0h; IRQ=4, 10, 11**		Serial Port I/O port address is 3E0h and the interrupt address is IRQ4, 10, 11
➔ **IO=2E0h; IRQ=4, 10, 11**		Serial Port I/O port address is 2E0h and the interrupt address is IRQ4, 10, 11

5.3.2.1.6 Serial Port 6 Configuration

➔ **Serial Port [Enabled]**

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

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

➔ **Change Settings [IO=2E0h; IRQ=10]**

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

➔ **IO=2E0h; IRQ=10**	**DEFAULT**	Serial Port I/O port address is 2E0h and the interrupt address is IRQ10
➔ **IO=3E8h; IRQ=4, 10, 11**		Serial Port I/O port address is 3E8h and the interrupt address is IRQ4, 10, 11
➔ **IO=2E8h; IRQ=4, 10, 11**		Serial Port I/O port address is 2E8h and the interrupt address is IRQ4, 10, 11
➔ **IO=3E0h; IRQ=4, 10, 11**		Serial Port I/O port address is 3E0h and the interrupt address is IRQ4, 10, 11
➔ **IO=2E0h; IRQ=4, 10, 11**		Serial Port I/O port address is 2E0h and the interrupt address is IRQ4, 10, 11

5.3.3 iWDD H/W Monitor

The **iWDD H/W Monitor** menu (**BIOS Menu 6**) contains the fan configuration submenus and displays operating temperature, fan speeds and system voltages.

```
Aptio Setup Utility – Copyright (C) 2017 American Megatrends, Inc.
Advanced

PC Health Status                                  Smart Fan Mode Select

System temperature              :+37 °C

CPU_FAN1 Speed                  :N/A
SYS_FAN1 Speed                  :N/A

                                                  ---------------------
CPU_CORE                        :+0.838 V         ←→: Select Screen
+5V                             :+4.944 V         ↑ ↓: Select Item
+12V                            :+12.161 V        EnterSelect
+DDR                            :+1.346 V         + -   Change Opt.
+5VSB                           :+4.944 V         F1    General Help
+3.3V                           :+3.357 V         F2    Previous Values
+3.3VSB                         :+3.311 V         F3    Optimized Defaults
                                                  F4    Save & Exit
> Smart Fan Mode Configuration                    ESC   Exit

Version 2.18.1263. Copyright (C) 2017 American Megatrends, Inc.
```

BIOS Menu 6: iWDD H/W Monitor

➔ **PC Health Status**

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

- System Temperatures:
  - System temperature
- Fan Speed:
  - CPU Fan Speed
  - System Fan Speed
- Voltages
  - CPU_CORE
  - +5V
  - +12V
  - +DDR

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

5.3.3.1 Smart Fan Mode Configuration

Use the **Smart Fan Mode Configuration** submenu (**BIOS Menu 7**) to configure fan temperature and speed settings.

```
Aptio Setup Utility – Copyright (C) 2017 American Megatrends, Inc.
Advanced

Smart Fan Mode Configuration                    Smart Fan Mode Select

CPU_FAN1 Smart Fan Control      [Manual Mode]
Manual Mode                     70

                                                ---------------------
SYS_FAN1 Smart Fan Control      [Manual Mode]   ←→: Select Screen
Manual Mode                     70              ↑ ↓: Select Item
                                                EnterSelect
                                                + -   Change Opt.
                                                F1    General Help
                                                F2    Previous Values
                                                F3    Optimized Defaults
                                                F4    Save & Exit
                                                ESC   Exit
Version 2.18.1263. Copyright (C) 2017 American Megatrends, Inc.
```

BIOS Menu 7: Smart Fan Mode Configuration

➔ **CPU_FAN1/SYS_FAN1 Smart Fan Control [Manual Mode]**

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

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

➔ **Manual Mode**

Users can set expected fan PWM. Use the + or – key to change the value or enter a decimal number between 1 and 100.

5.3.4 USB Configuration

Use the **USB Configuration** menu (**BIOS Menu 8**) to read USB configuration information and configure the USB settings.

```
Aptio Setup Utility – Copyright (C) 2017 American Megatrends, Inc.
Advanced

USB Configuration                                   Enables Legacy USB
                                                    support. AUTO option
USB Devices:                                        disables legacy support
      1 Keyboard, 1 Hub                             if no USB devices are
                                                    connected. DISABLE
Legacy USB Support              [Enabled]           option will keep USB
                                                    devices available only
                                                    for EFI applications.

                                                    ---------------------
                                                    ←→: Select Screen
                                                    ↑ ↓: Select Item
                                                    EnterSelect
                                                    F1   General Help
                                                    F2   Previous Values
                                                    F3    Optimized
                                                    Defaults
                                                    F4    Save
                                                    ESC   Exit
Version 2.18.1263. Copyright (C) 2017 American Megatrends, Inc.
```

BIOS Menu 8: USB Configuration

➔ **USB Devices**

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

➔ **Legacy USB Support [Enabled]**

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

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

5.3.5 CPU Configuration

Use the **CPU Configuration** menu (**BIOS Menu 9**) to view detailed CPU specifications and configure the CPU.

```
Aptio Setup Utility – Copyright (C) 2017 American Megatrends, Inc.
Advanced

CPU Configuration                                   Number of cores to enable
                                                    in each processor
Intel(R) Pentium(R) CPU N4200 @ 1.10GHz             package.
CPU Signature                    506C9
Microcode Patch                  24
Max CPU Speed                    1100 MHz
Min CPU Speed                    800 MHz
Processor Cores                  4
Intel HT Technology              Not Supported
Intel VT-x Technology            Supported
                                                    ----------------------
L1 Data Cache                    24 KB x 4
L1 Code Cache                    32 KB x 4          ←→: Select Screen
L2 Cache                         1024 KB x 2        ↑ ↓: Select Item
L3 Cache                         Not Present        EnterSelect
                                                    F1   General Help
EIST                             [Enabled]          F2   Previous Values
C-States                         [Disabled]         F3    Optimized
Intel Virtualization Technology  [Disabled]         Defaults
VT-d                             [Disabled]         F4    Save
                                                    ESC   Exit

Version 2.18.1263. Copyright (C) 2017 American Megatrends, Inc.
```

BIOS Menu 9: CPU Configuration

➔ **EIST [Enabled]**

Use the **EIST** option to enable or disable the Intel® Speed Step Technology.

➔ **Disabled**		Disables the Intel® Speed Step Technology.
➔ **Enabled**	**DEFAULT**	Enables the Intel® Speed Step Technology.

➔ **C-States [Disabled]**

Use the **C-States** option to enable or disable the C-states.

➔ **Disabled**	**DEFAULT**	Disables the C-state
➔ **Enabled**		Enables the C-state

➔ **Intel Virtualization Technology [Disabled]**

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

➔ **Disabled**	**DEFAULT**	Disables Intel® Virtualization Technology.
➔ **Enabled**		Enables Intel® Virtualization Technology.

➔ **VT-d [Disabled]**

Use the **VT-d** BIOS option to enable or disabled VT-d support.

➔ **Disabled**	**DEFAULT**	Disable VT-d support.
➔ **Enabled**		Enable VT-d support.

5.3.6 RTC Wake Settings

The **RTC Wake Settings** menu (**BIOS Menu 10**) configures RTC wake event.

```
Aptio Setup Utility – Copyright (C) 2017 American Megatrends, Inc.
Advanced

Wake system with Fixed Time      [Disabled]        Enable or disable System
                                                   wake on alarm event. When
                                                   enabled, System will
                                                   wake on the
                                                   date::hr::min::sec
                                                   specified

                                                   ----------------------

                                                   ←→: Select Screen
                                                   ↑ ↓: Select Item
                                                   EnterSelect
                                                   F1   General Help
                                                   F2   Previous Values
                                                   F3   Optimized Defaults
                                                   F4   Save
                                                   ESC  Exit
Version 2.18.1263. Copyright (C) 2017 American Megatrends, Inc.
```

BIOS Menu 10: RTC Wake Settings

➔ **Wake system with Fixed Time [Disabled]**

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

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

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

Wake up date

Wake up hour

Wake up minute

Wake up second

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

5.3.7 Power Saving Configuration

Use the **Power Saving Configuration** menu (BIOS Menu 11) to configure system to reduce power consumption in system off state.

```
Aptio Setup Utility – Copyright (C) 2017 American Megatrends, Inc.
Advanced

Power Saving Configuration                          Enable or Disable to
                                                    reduce power consumption
Power Saving Function(ERP)       [Disabled]         in system off state.

                                                    ---------------------

                                                    ←→: Select Screen
                                                    ↑ ↓: Select Item
                                                    Enter Select
                                                    F1   General Help
                                                    F2   Previous Values
                                                    F3    Optimized
                                                    Defaults
                                                    F4    Save
                                                    ESC   Exit
Version 2.18.1263. Copyright (C) 2017 American Megatrends, Inc.
```

BIOS Menu 11: Power Saving Configuration

➔ **Power Saving Function(ERP) [Disabled]**

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

➔ **Disabled** **DEFAULT** Power saving function is disabled.

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

5.3.8 Serial Port Console Redirection

The **Serial Port Console Redirection** menu (**BIOS Menu 12**) allows the console redirection options to be configured. Console redirection allows users to maintain a system remotely by re-directing keyboard input and text output through the serial port.

```
Aptio Setup Utility – Copyright (C) 2017 American Megatrends, Inc.
Advanced

 COM1                                          Console Redirection
 Console Redirection            [Disabled]     Enable or Disable
> Console Redirection Settings

 COM2
 Console Redirection            [Disabled]
> Console Redirection Settings

 COM3
 Console Redirection            [Disabled]
> Console Redirection Settings

 COM4
 Console Redirection            [Disabled]     ---------------------
> Console Redirection Settings                  ←→: Select Screen
                                               ↑ ↓: Select Item
 COM5                                          EnterSelect
 Console Redirection            [Disabled]     F1   General Help
> Console Redirection Settings                  F2   Previous Values
                                               F3    Optimized
 COM6                                          Defaults
 Console Redirection            [Disabled]     F4    Save
> Console Redirection Settings                  ESC   Exit

 Legacy Console Redirection
> Legacy Console Redirection Settings

Version 2.18.1263. Copyright (C) 2017 American Megatrends, Inc.
```

BIOS Menu 12: Serial Port Console Redirection

➔ **Console Redirection [Disabled]**

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

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

5.3.8.1 Legacy Console Redirection Settings

The **Legacy Console Redirection Settings** menu (**BIOS Menu 13**) allows the legacy console redirection options to be configured.

```
Aptio Setup Utility – Copyright (C) 2017 American Megatrends, Inc.
Advanced

Legacy Serial Redirection Port   [COM1]

Select a COM port to
display redirection of
Legacy OS and Legacy
OPROM Messages

---------------------
←→: Select Screen
↑ ↓: Select Item
EnterSelect
F1   General Help
F2   Previous Values
F3    Optimized
Defaults
F4    Save
ESC   Exit

Version 2.18.1263. Copyright (C) 2017 American Megatrends, Inc.
```

BIOS Menu 13: Legacy Console Redirection Settings

➔ **Legacy Serial Redirection Port [COM1]**

Use the **Legacy Serial Redirection Port** option to specify a COM port to display redirection of legacy OS and legacy OPROM messages. The options include:

- COM1 **DEFAULT**
- COM2
- COM3
- COM4
- COM5
- COM6

5.3.9 IEI Feature

Use the **IEI Feature** menu (**BIOS Menu 14**) to configure One Key Recovery function.

```
Aptio Setup Utility – Copyright (C) 2017 American Megatrends, Inc.
Advanced

iEi Feature                                   Auto Recovery Function
                                              Reboot and recover
Auto Recovery Function          [Disabled]    system automatically
                                              within 10 min, when OS
                                              crashes. Please install
                                              Auto Recovery API
                                              service before enabling
                                              this function

                                              ----------------------

                                              ←→: Select Screen
                                              ↑ ↓: Select Item
                                              EnterSelect
                                              F1   General Help
                                              F2   Previous Values
                                              F3   Optimized Defaults
                                              F4   Save
                                              ESC  Exit
Version 2.18.1263. Copyright (C) 2017 American Megatrends, Inc.
```

BIOS Menu 14: IEI Feature

➔ **Auto Recovery Function [Disabled]**

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

➔ **Disabled** **DEFAULT** Auto recovery function disabled

➔ **Enabled** Auto recovery function enabled

5.4 Chipset

Use the **Chipset** menu (**BIOS Menu 15**) to access the north bridge and south bridge 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) 2017 American Megatrends, Inc.
  Main    Advanced  Chipset   Security    Boot   Save & Exit

> North Bridge                                   North Bridge Parameters
> South Bridge


                                                 ---------------------
                                                 ←→: Select Screen
                                                 ↑ ↓: Select Item
                                                 EnterSelect
                                                 +/-:  Change Opt.
                                                 F1   General Help
                                                 F2   Previous Values
                                                 F3   Optimized Defaults
                                                 F4   Save & Exit
                                                 ESC  Exit
        Version 2.18.1263. Copyright (C) 2017 American Megatrends, Inc.
```

BIOS Menu 15: Chipset

5.4.1 North Bridge Configuration

Use the **North Bridge Configuration** menu (**BIOS Menu 16**) to configure the Intel IGD settings.

```
Aptio Setup Utility – Copyright (C) 2017 American Megatrends, Inc.
                    Chipset

> Intel IGD Configuration                    Intel IGD Configuration
> LCD Control

Memory Information                           ---------------------
                                             ←→: Select Screen
Total Memory                2048 MB(LPDDR3)  ↑ ↓: Select Item
Dimm1                       2048 MB(LPDDR3)  EnterSelect
Dimm2                       Not Present      +/-:  Change Opt.
                                             F1:   General Help
                                             F2:   Previous Values
                                             F3:   Optimized Defaults
                                             F4:   Save & Exit
                                             ESC:  Exit

Version 2.17.1249. Copyright (C) 2017 American Megatrends, Inc.
```

BIOS Menu 16: North Bridge Configuration

➔ **Memory Information**

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

5.4.1.1 Intel IGD Configuration

Use the **Intel IGD Configuration** menu (**BIOS Menu 17**) to configure the video device connected to the system.

```
Aptio Setup Utility – Copyright (C) 2017 American Megatrends, Inc.
                    Chipset

Intel IGD Configuration                    Select which of IGD/PCIe
Primary Display                [IGD]       Graphics device should
Integrated Graphics Device     [Enable]    be Primary Display.
DVMT Pre-Allocated             [256M]
DVMT Total Gfx Mem             [MAX]       ---------------------
                                           ←→: Select Screen
                                           ↑ ↓: Select Item
                                           EnterSelect
                                           +/-:  Change Opt.
                                           F1:   General Help
                                           F2:   Previous Values
                                           F3:   Optimized Defaults
                                           F4:   Save & Exit
                                           ESC:  Exit
Version 2.18.1263. Copyright (C) 2017 American Megatrends, Inc.
```

BIOS Menu 17: Intel IGD Configuration

➔ **Primary Display [IGD]**

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

- IGD **DEFAULT**
- PCIe

➔ **Integrated Graphics Device [Enable]**

Use the **Integrated Graphics Device** option enables or disables Integrated Graphics Device (IGD).

➔ **Disable** Always disable IGD.

➔ **Enable** **DEFAULT** Enabled Integrated Graphics Device (IGD) when selected as the Primary Video Adaptor.

➔ **DVMT Pre-Allocated [256MB]**

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

- 64M
- 128M
- 256M **DEFAULT**
- 512M

➔ **DVMT Total Gfx Mem [MAX]**

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

- 128M
- 256M
- MAX **DEFAULT**

5.4.1.2 LCD Control

Use the **LCD Control** menu (**BIOS Menu 18**) to configure the display device connected to the system.

```
Aptio Setup Utility – Copyright (C) 2017 American Megatrends, Inc.
                    Chipset

LCD Control                                        Select the Video Device
                                                   which will be activated
Primary IGFX Boot Display        [Auto]            during POST. This has no
                                                   effect if external
LVDS Panel Detect                [Not Installed]   graphics present.
                                                   Secondary boot display
Panel Setting                                      selection will appear
                                                   based on your selection.
Backlight Control Mode           [LED]             VGA modes will be
Backlight Control Type           [DC]              supported only on
Backlight Control Voltage Level  [3.3V]            primary display

                                                   ---------------------
                                                   ←→: Select Screen
                                                   ↑ ↓: Select Item
                                                   EnterSelect
                                                   +/-:  Change Opt.
                                                   F1:   General Help
                                                   F2:   Previous Values
                                                   F3:   Optimized Defaults
                                                   F4:   Save & Exit
                                                   ESC:  Exit
Version 2.18.1263. Copyright (C) 2017 American Megatrends, Inc.
```

BIOS Menu 18: LCD Control

➔ **Primary IGFX Boot Display [Auto]**

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

- Auto **DEFAULT**
- VGA1
- LVDS1
- HDMI1

➔ **Backlight Control Mode [LED]**

Use the **Backlight Control Mode** option to specify the backlight control mode. Configuration options are listed below.

- LED **DEFAULT**
- CCFL

➔ **Backlight Control Type [DC]**

Use the **Backlight Control Type** option to specify the backlight control type. Configuration options are listed below.

- PWM
- DC **DEFAULT**

➔ **Backlight Control Voltage Level [3.3V]**

Use the **Backlight Control Voltage Level** option to specify the backlight control voltage. Configuration options are listed below.

- 3.3V **DEFAULT**
- 5.0V

5.4.2 South Bridge Configuration

Use the **South Bridge Configuration** menu (**BIOS Menu 19**) to configure the south bridge chipset.

```
Aptio Setup Utility – Copyright (C) 2017 American Megatrends, Inc.
                    Chipset

Auto Power Button Status        [Disable (ATX)]      HD-Audio Configuration
> HD-Audio Configuration                             Settings.
> PCI Express Configuration
> SATA Configuration
                                                     ---------------------
Restore AC Power Loss           [Last State]         ←→: Select Screen
                                                     ↑ ↓: Select Item
USB Power SW1                   [+5V DUAL]           EnterSelect
USB Power SW2                   [+5V DUAL]           +/-:  Change Opt.
                                                     F1:  General Help
                                                     F2:  Previous Values
                                                     F3:  Optimized Defaults
                                                     F4:  Save & Exit
                                                     ESC: Exit
Version 2.18.1263. Copyright (C) 2017 American Megatrends, Inc.
```

BIOS Menu 19: South Bridge Configuration

➔ **Restore on 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.

➔ **USB SW1 [+5V DUAL]**

Use the **USB SW1** BIOS option to configure whether to provide power to the two external USB 3.0 connectors labeled USB23 (the one close to power input connector) when the system is in S3/S4 sleep state.

➔ **+5V DUAL**	**DEFAULT**	Power is provided to the external USB 3.0 connectors (USB23) when the system is in S3/S4 sleep state.
➔ **+5V**		Power is not provided to the external USB 3.0 connectors (USB23) when the system is in S3/S4 sleep state

➔ **USB SW2 [+5V DUAL]**

Use the **USB SW2** BIOS option to configure whether to provide power to the two external USB 3.0 connectors labeled USB01 when the system is in S3/S4 sleep state.

➔ **+5V DUAL**	**DEFAULT**	Power is provided to the external USB 3.0 connectors (USB01) when the system is in S3/S4 sleep state.
➔ **+5V**		Power is not provided to the external USB 3.0 connectors (USB01) when the system is in S3/S4 sleep state

5.4.2.1 HD-Audio Configuration

Use the **HD-Audio Configuratio**n menu (**BIOS Menu 20**) to configure the HD Audio.

```
Aptio Setup Utility – Copyright (C) 2017 American Megatrends, Inc.
                    Chipset

HD-Audio Configuration                    Enable/Disable HD-Audio
HD-Audio Support              [Enable]    Support

                                          ---------------------
                                          ←→: Select Screen
                                          ↑ ↓: Select Item
                                          EnterSelect
                                          F1   General Help
                                          F2   Previous Values
                                          F3    Optimized
                                          Defaults
                                          F4    Save
                                          ESC   Exit

Version 2.18.1263. Copyright (C) 2017 American Megatrends, Inc.
```

BIOS Menu 20: HD-Audio Configuration

➔ **HD-Audio Support [Enable]**

Use the **HD-Audio Support** option to enable or disable the High Definition Audio controller.

➔ **Disable**		The onboard High Definition Audio controller is disabled
➔ **Enable**	**DEFAULT**	The onboard High Definition Audio controller is detected automatically and enabled

5.4.2.2 PCI Express Configuration

Use the **PCI Express Configuratio**n menu (**BIOS Menu 21**) to configure the PCI Express.

```
Aptio Setup Utility – Copyright (C) 2017 American Megatrends, Inc.
                    Chipset

PCI Express Configuration                    Compliance Mode
> Onboard LAN1                               Enable/Disable
> Onboard LAN2
> MPCIE1                                     ---------------------
                                             ←→: Select Screen
                                             ↑ ↓: Select Item
                                             EnterSelect
                                             F1   General Help
                                             F2   Previous Values
                                             F3    Optimized
                                             Defaults
                                             F4    Save
                                             ESC   Exit

Version 2.18.1263. Copyright (C) 2017 American Megatrends, Inc.
```

BIOS Menu 21: PCI Express Configuration

5.4.2.2.1 Onboard LAN

Use the **Onboard LAN** menus (**BIOS Menu 22**) to configure the LAN 1 or LAN 2 port.

```
Aptio Setup Utility – Copyright (C) 2017 American Megatrends, Inc.
                    Chipset

Onboard LAN1                    [Auto]          Control the PCI Express
                                                Root Port.
                                                AUTO: To disable unused
                                                root port automatically
                                                for the most optimum
                                                power savings.
                                                Enable: Enable PCIe root
                                                port
                                                Disable: Disable PCIe
                                                root port

                                                --------------------
                                                ←→: Select Screen
                                                ↑ ↓: Select Item
                                                EnterSelect
                                                F1   General Help
                                                F2   Previous Values
                                                F3    Optimized
                                                Defaults
                                                F4    Save
                                                ESC   Exit

Version 2.18.1263. Copyright (C) 2017 American Megatrends, Inc.
```

BIOS Menu 22: Onboard LAN

➔ **Onboard LAN1/2 [Auto]**

Use the **Onboard LAN1/** option to enable or disable the LAN port.

➔ **Disable**		Disable the LAN port
➔ **Enable**		Enable the LAN port
➔ **Auto**	**DEFAULT**	Disable unused root LAN port automatically for the most optimum power savings.

5.4.2.2.2 MPCIE1

Use the **MPCIE1** menu (**BIOS Menu 23**) to configure the PCIe Mini slot.

```
Aptio Setup Utility – Copyright (C) 2017 American Megatrends, Inc.
                    Chipset

MPCIE1                          [Auto]        Control the PCI Express
PCIe Speed                      [Auto]        Root Port.
                                              AUTO: To disable unused
                                              root port automatically
                                              for the most optimum
                                              power savings.
                                              Enable: Enable PCIe root
                                              port
                                              Disable: Disable PCIe
                                              root port

                                              --------------------
                                              ←→: Select Screen
                                              ↑ ↓: Select Item
                                              EnterSelect
                                              F1   General Help
                                              F2   Previous Values
                                              F3    Optimized
                                              Defaults
                                              F4    Save
                                              ESC   Exit

Version 2.18.1263. Copyright (C) 2017 American Megatrends, Inc.
```

BIOS Menu 23: MPCIE1

➔ **MPCIE1 [Auto]**

Use the **MPCIE1** option to enable or disable the PCIe Mini slot.

➔ **Disable**		Disable PCIe Mini slot.
➔ **Enable**		Enable PCIe Mini slot.
➔ **Auto**	**DEFAULT**	Disable unused root port automatically for the most optimum power savings.

➔ **PCIe Speed [Auto]**

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

➔ **Auto**	**DEFAULT**	Configure PCIe Mini slot speed to auto
➔ **Gen 1**		Configure PCIe Mini slot speed to Gen1
➔ **Gen 2**		Configure PCIe Mini slot speed to Gen2

5.4.2.2.3 SATA Configuration

Use the **SATA Configuration** menu (**BIOS Menu 24**) to change and/or set the configuration of the SATA devices installed in the system.

```
Aptio Setup Utility – Copyright (C) 2017 American Megatrends, Inc.
                    Chipset

SATA Configuration                          Enables or Disables the
SATA Controller                [Enable]     Chipset SATA Controller.
SATA Mode Selection            [AHCI]       The Chipset SATA
                                            controller supports the
  SATA1                        [Empty]      2 black internal SATA
  Hot Plug                     [Disabled]   ports (up to 3Gb/s
                                            supported per port).
  SATA2                        [Empty]
  Hot Plug                     [Disabled]   --------------------
                                            ←→: Select Screen
                                            ↑ ↓: Select Item
                                            EnterSelect
                                            F1   General Help
                                            F2   Previous Values
                                            F3    Optimized
                                            Defaults
                                            F4    Save
                                            ESC   Exit

Version 2.18.1263. Copyright (C) 2017 American Megatrends, Inc.
```

BIOS Menu 24: SATA Configuration

➔ **STAT Controller [Enable]**

Use the **STAT Controller** option to enable or disable the SATA device.

➔ **Enable**	**DEFAULT**	Enables the SATA device.
➔ **Disable**		Disables the SATA device.

➔ **SATA Mode Selection [AHCI]**

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

➔ **AHCI**	**DEFAULT**	Configures SATA device as AHCI device.

➔ **Hot Plug [Disabled]**

Use the **Hot Plug** option to enable or disable the SATA device hot plug.

➔ **Disabled**	**DEFAULT**	Disable the SATA device hot plug capability.
➔ **Enabled**		Enable the SATA device hot plug capability

5.5 Security

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

```
      Aptio Setup Utility – Copyright (C) 2017 American Megatrends, Inc.
  Main    Advanced   Chipset   Security    Boot    Save & Exit

Password Description                                  Set Administrator
                                                      Password
If ONLY the Administrator's password is set,
then this only limits access to Setup and is
only asked for when entering Setup                    ---------------------
If ONLY the User's password is set, then this         ←→: Select Screen
is a power on password and must be entered to         ↑ ↓: Select Item
boot or enter Setup. In Setup the User will           EnterSelect
have Administrator rights.                            F1   General Help
The password length must be:                          F2   Previous Values
Minimum length                  3                     F3    Optimized
Maximum length                  20                    Defaults
                                                      F4    Save
Setup Administrator Password                          ESC   Exit
User Password

        Version 2.18.1263. Copyright (C) 2017 American Megatrends, Inc.
```

BIOS Menu 25: Security

➔ **Setup Administrator Password**

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

➔ **User Password**

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

5.6 Boot

Use the **Boot** menu (**BIOS Menu 26**) to configure system boot options.

```
      Aptio Setup Utility – Copyright (C) 2017 American Megatrends, Inc.
  Main    Advanced   Chipset   Security   Boot    Save & Exit

Boot Configuration                                  Select the keyboard
Bootup NumLock State            [On]                NumLock state
Quiet Boot                      [Enabled]
Launch PXE OpROM                [Disabled]
Option ROM Messages             [Force BIOS]        ---------------------
UEFI Boot                       [Disabled]          ←→: Select Screen
                                                    ↑ ↓: Select Item
Boot Option Priorities                              EnterSelect
                                                    F1   General Help
Driver Option Priorities                            F2   Previous Values
                                                    F3   Optimized Defaults
                                                    F4   Save
                                                    ESC  Exit
        Version 2.18.1263. Copyright (C) 2017 American Megatrends, Inc.
```

BIOS Menu 26: Boot

➔ **Bootup NumLock State [On]**

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

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

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

➔ **Quiet Boot [Enabled]**

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

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

➔ **Launch PXE OpROM [Disabled]**

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

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

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

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

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

➔ **UEFI Boot [Disabled]**

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

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

➔ **Boot Option Priority**

Use the **Boot Option Priority** function to set the system boot sequence from the available devices. The drive sequence also depends on the boot sequence in the individual device section.

5.7 Save & Exit

Use the **Save & Exit** menu (**BIOS Menu 27**) to load default BIOS values, optimal failsafe values and to save configuration changes.

```
     Aptio Setup Utility – Copyright (C) 2017 American Megatrends, Inc.
 Main    Advanced   Chipset   Security    Boot    Save & Exit

 Save Changes and Reset                          Reset the system after
 Discard Changes and Reset                       saving the changes.

 Restore Defaults
 Save as User Defaults
 Restore User Defaults

                                                 ---------------------
                                                 ←→: Select Screen
                                                 ↑ ↓: Select Item
                                                 EnterSelect
                                                 F1   General Help
                                                 F2   Previous Values
                                                 F3    Optimized
                                                 Defaults
                                                 F4    Save
                                                 ESC   Exit
      Version 2.18.1263. Copyright (C) 2017 American Megatrends, Inc.
```

BIOS Menu 27: Save & 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.

Chapter

6

Software Drivers

6.1 Software Installation

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

Figure 6-1: IEI Resource Download Center

IEI provides the following drivers for Windows 7, Windows 8 and Windows 10 operating systems.

- Chipset
- Graphics
- LAN
- Audio
- Serial I/O
- TXE

NOTE:

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

NOTE:

The Intel TXE requires that Microsoft's "Kernel-Mode Driver Framework (KMDF) version 1.11 update for Windows 7" must be installed first on Windows 7 OS. If the KMDF is not installed, either error 37 or error 28 may appear on the Intel TXE device in Device Manager.

Please find the KMDF version 1.11 update for Windows 7 in the TXE driver folder in the driver CD or click the following link to download it.

http://www.microsoft.com/en-us/download/details.aspx?id=38423

Appendix

A

Regulatory Compliance

DECLARATION OF CONFORMITY

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

FCC WARNING

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

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

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

Appendix

B

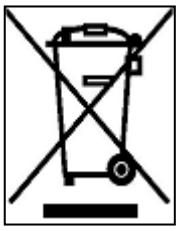
Product Disposal

CAUTION:

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

Dispose of used batteries according to instructions and local regulations.

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



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

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

Appendix

C

BIOS Menu Options

Appendix

D

Terminology

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.
MAC	The Media Access Control (MAC) protocol enables several terminals or network nodes to communicate in a LAN, or other multipoint networks.
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.

Appendix

E

Digital I/O Interface

The DIO connector on the KINO-DAL is interfaced to GPIO ports on the Super I/O chipset. The DIO has both 8-bit digital inputs and 8-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	
Sub-function:	
AL – 8	:Set the digital port as INPUT
AL	:Digital I/O input value

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 output value

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

F

Watchdog Timer

NOTE:

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

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

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

INT 15H:

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

Table F-1: AH-6FH Sub-function

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

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

NOTE:

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

EXAMPLE PROGRAM:

```
; INITIAL TIMER PERIOD COUNTER

;
W_LOOP:
;

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

;
; ADD THE APPLICATION PROGRAM HERE
;

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

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

;
; EXIT ;
```

Appendix

G

Hazardous Materials Disclosure

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 following table.

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

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

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

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

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

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

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

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