

**MODEL:**

**NANO-CV-D25502/N26002**

**EPIC SBC with Intel® Atom™ D2550/N2600 Processor,  
DDR3, Dual VGA, LVDS, Dual PCIe GbE, USB 2.0,  
Dual PCIe Mini, SATA 3Gb/s, Audio and RoHS**

## **User Manual**

# Revision

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Date	Version	Changes
August 27, 2015	1.02	Updated Section 1.5: Dimensions Updated Section 4.5: Chassis Installation
December 10, 2014	1.01	Modified Table 4-5: mSATA/PCIe Mini Mode Selection Jumper Settings
November 23, 2012	1.00	Initial release

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# Manual Conventions

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## **WARNING**

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



## **CAUTION**

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



## **NOTE**

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



## **HOT SURFACE**

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

# Table of Contents

<b>1 INTRODUCTION.....</b>	<b>1</b>
1.1 INTRODUCTION.....	2
1.2 MODEL VARIATIONS .....	2
1.3 FEATURES.....	2
1.4 CONNECTORS .....	3
1.5 DIMENSIONS.....	4
1.6 DATA FLOW .....	6
1.7 TECHNICAL SPECIFICATIONS .....	7
<b>2 PACKING LIST.....</b>	<b>9</b>
2.1 ANTI-STATIC PRECAUTIONS .....	10
2.2 UNPACKING PRECAUTIONS.....	10
2.3 PACKING LIST.....	11
2.4 OPTIONAL ITEMS .....	12
<b>3 CONNECTORS .....</b>	<b>13</b>
3.1 PERIPHERAL INTERFACE CONNECTORS.....	14
3.1.1 NANO-CV-D25502/N26002 Layout.....	14
3.1.2 Peripheral Interface Connectors .....	14
3.1.3 External Interface Panel Connectors.....	15
3.2 INTERNAL PERIPHERAL CONNECTORS .....	16
3.2.1 5 V SATA Power Connectors.....	16
3.2.2 Audio Connector .....	16
3.2.3 Backlight Inverter Connector .....	17
3.2.4 Battery Connector.....	18
3.2.5 Digital Input/Output (DIO) Connector.....	19
3.2.6 Fan Connectors.....	20
3.2.7 Front Panel Connector .....	21
3.2.8 Keyboard/Mouse Connector .....	21
3.2.9 LVDS1 Connector .....	22



3.2.10	<i>PCIe Mini Card Slots</i> .....	23
3.2.11	<i>Power Connector (9V~28V)</i> .....	25
3.2.12	<i>RS-232 Serial Port Connectors</i> .....	26
3.2.13	<i>RS-422/485 Serial Port Connector</i> .....	27
3.2.14	<i>SATA Drive Connectors</i> .....	28
3.2.15	<i>SO-DIMM Connector</i> .....	29
3.2.16	<i>USB Connector</i> .....	29
3.3	<b>EXTERNAL PERIPHERAL INTERFACE CONNECTOR PANEL</b> .....	30
3.3.1	<i>Ethernet Connectors</i> .....	30
3.3.2	<i>USB Connectors</i> .....	31
3.3.3	<i>VGA Connectors</i> .....	32
<b>4</b>	<b>INSTALLATION</b> .....	<b>33</b>
4.1	<b>ANTI-STATIC PRECAUTIONS</b> .....	34
4.2	<b>INSTALLATION CONSIDERATIONS</b> .....	34
4.3	<b>SO-DIMM INSTALLATION</b> .....	36
4.4	<b>JUMPER SETTINGS</b> .....	37
4.4.1	<i>AT/ATX Power Selection Jumper</i> .....	37
4.4.2	<i>Clear CMOS Jumper</i> .....	38
4.4.3	<i>LVDS1 Voltage Selection</i> .....	39
4.4.4	<i>mSATA/PCIe Mini Selection</i> .....	40
4.5	<b>CHASSIS INSTALLATION</b> .....	41
4.5.1	<i>Heat Sink Enclosure</i> .....	41
4.5.2	<i>Motherboard Installation</i> .....	42
4.6	<b>INTERNAL PERIPHERAL DEVICE CONNECTIONS</b> .....	43
4.6.1	<i>AT/ATX Power Connection</i> .....	43
4.6.2	<i>Audio Kit Installation</i> .....	44
4.6.3	<i>LVDS LCD Installation</i> .....	45
4.6.4	<i>PCIe Mini Card Installation</i> .....	48
4.6.5	<i>SATA Drive Connection</i> .....	49
4.6.6	<i>Single RS-232 Cable</i> .....	50
<b>5</b>	<b>BIOS</b> .....	<b>51</b>
5.1	<b>INTRODUCTION</b> .....	52
5.1.1	<i>Starting Setup</i> .....	52

## NANO-CV-D25502/N26002 EPIC SBC

5.1.2	Using Setup .....	52
5.1.3	Getting Help.....	53
5.1.4	Unable to Reboot after Configuration Changes .....	53
5.1.5	BIOS Menu Bar.....	53
5.2	MAIN.....	54
5.3	ADVANCED .....	55
5.3.1	ACPI Settings .....	56
5.3.2	RTC Wake Settings .....	57
5.3.3	CPU Configuration.....	58
5.3.4	IDE Configuration .....	59
5.3.5	USB Configuration.....	60
5.3.6	F81866 Super IO Configuration.....	61
5.3.6.1	Serial Port n Configuration .....	62
5.3.7	F81866 H/W Monitor.....	66
5.3.7.1	Smart Fan Mode Configuration .....	67
5.3.8	Serial Port Console Redirection .....	68
5.3.9	iEi Feature .....	70
5.4	CHIPSET .....	71
5.4.1	Host Bridge Configuration .....	71
5.4.1.1	Intel IGD Configuration.....	72
5.4.2	South Bridge Configuration.....	74
5.5	BOOT.....	75
5.6	SECURITY .....	77
5.7	SAVE & EXIT .....	77
<b>6</b>	<b>SOFTWARE DRIVERS .....</b>	<b>79</b>
6.1	AVAILABLE SOFTWARE DRIVERS .....	80
6.2	STARTING THE DRIVER PROGRAM .....	80
6.3	CHIPSET DRIVER INSTALLATION.....	82
6.4	VGA DRIVER INSTALLATION.....	86
6.5	LAN DRIVER INSTALLATION .....	90
6.6	AUDIO DRIVER INSTALLATION .....	92
<b>A</b>	<b>REGULATORY COMPLIANCE .....</b>	<b>96</b>
<b>B</b>	<b>BIOS OPTIONS .....</b>	<b>98</b>

<b>C TERMINOLOGY .....</b>	<b>101</b>
<b>D DIGITAL I/O INTERFACE.....</b>	<b>105</b>
D.1 INTRODUCTION.....	106
D.2 ASSEMBLY LANGUAGE SAMPLE 1.....	107
D.3 ASSEMBLY LANGUAGE SAMPLE 2.....	107
<b>E WATCHDOG TIMER.....</b>	<b>108</b>
<b>F HAZARDOUS MATERIALS DISCLOSURE.....</b>	<b>111</b>
F.1 HAZARDOUS MATERIALS DISCLOSURE TABLE FOR IPB PRODUCTS CERTIFIED AS ROHS COMPLIANT UNDER 2002/95/EC WITHOUT MERCURY .....	112



# List of Figures

Figure 1-1: NANO-CV-D25502/N26002 .....	2
Figure 1-2: Connectors .....	3
Figure 1-3: NANO-CV-D25502/N26002 Dimensions (mm).....	5
Figure 1-4: Data Flow Diagram.....	6
Figure 3-1: Connectors and Jumpers.....	14
Figure 3-2: 5 V SATA Power Connector Locations .....	16
Figure 3-3: Audio Connector Location .....	17
Figure 3-4: Backlight Inverter Connector Location.....	18
Figure 3-5: Battery Connector Location.....	19
Figure 3-6: Digital I/O Connector Location .....	19
Figure 3-7: Fan Connector Locations.....	20
Figure 3-8: Front Panel Connector Location .....	21
Figure 3-9: Keyboard/Mouse Connector Location .....	22
Figure 3-10: LVDS1 Connector Location .....	23
Figure 3-11: PCIe Mini Card Slot Locations.....	24
Figure 3-12: Power Connector Location .....	25
Figure 3-13: RS-232 Serial Port Connector Locations.....	26
Figure 3-14: RS-422/485 Connector Location.....	27
Figure 3-15: SATA Drive Connector Locations .....	28
Figure 3-16: SO-DIMM Connector Location .....	29
Figure 3-17: USB Connector Location.....	29
Figure 3-18: External Peripheral Interface Connector .....	30
Figure 3-19: RJ-45 Ethernet Connector.....	31
Figure 3-20: VGA Connector .....	32
Figure 4-1: SO-DIMM Installation .....	36
Figure 4-2: AT/ATX Power Selection Jumper Location .....	38
Figure 4-3: Clear CMOS Jumper Location .....	39
Figure 4-4: LVDS1 Voltage Selection Jumper Location .....	40
Figure 4-5: mSATA/PCIe Mini Mode Selection Jumper Location .....	40
Figure 4-6: Heat Sink Retention Screws .....	41

Figure 4-7: Motherboard Installation Example .....	42
Figure 4-8: Power Cable to Motherboard Connection .....	43
Figure 4-9: Connect Power Cable to Power Supply .....	44
Figure 4-10: Audio Kit Cable Connection .....	45
Figure 4-11: LVDS Connector.....	46
Figure 4-12: Backlight Inverter Connection.....	47
Figure 4-13: PCIe Mini Card Installation.....	48
Figure 4-14: SATA Drive Cable Connection.....	49
Figure 4-15: Single RS-232 Cable Installation .....	50
Figure 6-1: Start Up Screen .....	81
Figure 6-2: Drivers .....	81
Figure 6-3: Chipset Driver Screen.....	82
Figure 6-4: Chipset Driver Welcome Screen.....	83
Figure 6-5: Chipset Driver License Agreement .....	84
Figure 6-6: Chipset Driver Read Me File .....	84
Figure 6-7: Chipset Driver Setup Operations .....	85
Figure 6-8: Chipset Driver Installation Finish Screen.....	86
Figure 6-9: VGA Driver Welcome Screen .....	87
Figure 6-10: VGA Driver License Agreement.....	88
Figure 6-11: VGA Driver Read Me File.....	88
Figure 6-12: VGA Driver Setup Operations .....	89
Figure 6-13: VGA Driver Installation Finish Screen .....	90
Figure 6-14: LAN Driver Welcome Screen .....	91
Figure 6-15: LAN Driver Installation .....	91
Figure 6-16: LAN Driver Installation Complete.....	92
Figure 6-17: Audio Driver Installation File Extraction.....	93
Figure 6-18: Audio Driver Welcome Screen.....	93
Figure 6-19: Audio Driver Installation.....	94
Figure 6-20: Audio Driver Installation Complete .....	94

# List of Tables

Table 1-1: NANO-CV-D25502/N26002 Model Variations.....	2
Table 1-2: NANO-CV-D25502/N26002 Specifications .....	8
Table 2-1: Packing List.....	12
Table 2-2: Optional Items .....	12
Table 3-1: Peripheral Interface Connectors .....	15
Table 3-2: Rear Panel Connectors .....	15
Table 3-3: 5 V SATA Power Connector Pinouts .....	16
Table 3-4: Audio Connector Pinouts .....	17
Table 3-5: Backlight Inverter Connector Pinouts .....	18
Table 3-6: Battery Connector Pinouts .....	19
Table 3-7: Digital I/O Connector Pinouts.....	20
Table 3-8: Fan Connector Pinouts .....	20
Table 3-9: Front Panel Connector Pinouts.....	21
Table 3-10: Keyboard/Mouse Connector Pinouts .....	22
Table 3-11: LVDS1 Connector Pinouts.....	23
Table 3-12: PCIe Mini Card Slot Pinouts .....	25
Table 3-13: Power Connector Pinouts.....	26
Table 3-14: RS-232 Serial Port Connector Pinouts .....	26
Table 3-15: RS-422/485 Connector Pinouts .....	27
Table 3-16: DB-9 RS-422/485 Pinouts.....	27
Table 3-17: SATA Drive Connector Pinouts.....	28
Table 3-18: USB Connector Pinouts.....	30
Table 3-19: LAN Pinouts .....	31
Table 3-20: RJ-45 Ethernet Connector LEDs .....	31
Table 3-21: USB Port Pinouts.....	31
Table 3-22: VGA Connector Pinouts.....	32
Table 4-1: Jumpers .....	37
Table 4-2: AT/ATX Power Selection Jumper Settings.....	38
Table 4-3: Clear CMOS Jumper Settings.....	38
Table 4-4: LVDS1 Voltage Selection Jumper Settings.....	39

<b>Table 4-5: mSATA/PCIe Mini Mode Selection Jumper Settings.....</b>	<b>40</b>
<b>Table 5-1: BIOS Navigation Keys .....</b>	<b>53</b>

# BIOS Menus

---

BIOS Menu 1: Main .....	54
BIOS Menu 2: Advanced .....	55
BIOS Menu 3: ACPI Settings .....	56
BIOS Menu 4: RTC Wake Settings .....	57
BIOS Menu 5: CPU Configuration .....	58
BIOS Menu 6: IDE Configuration .....	59
BIOS Menu 7: USB Configuration .....	60
BIOS Menu 8: Super IO Configuration.....	61
BIOS Menu 9: Serial Port n Configuration Menu .....	62
BIOS Menu 10: F81866 H/W Monitor .....	66
BIOS Menu 11: Smart Fan Mode Configuration .....	67
BIOS Menu 12: Serial Port Console Redirection .....	68
BIOS Menu 13: iEi Feature .....	70
BIOS Menu 14: Chipset .....	71
BIOS Menu 15: Host Bridge Configuration .....	72
BIOS Menu 16: Intel IGD Configuration.....	72
BIOS Menu 17: South Bridge Configuration.....	74
BIOS Menu 18: Boot .....	75
BIOS Menu 19: Security .....	77
BIOS Menu 20: Save & Exit.....	78



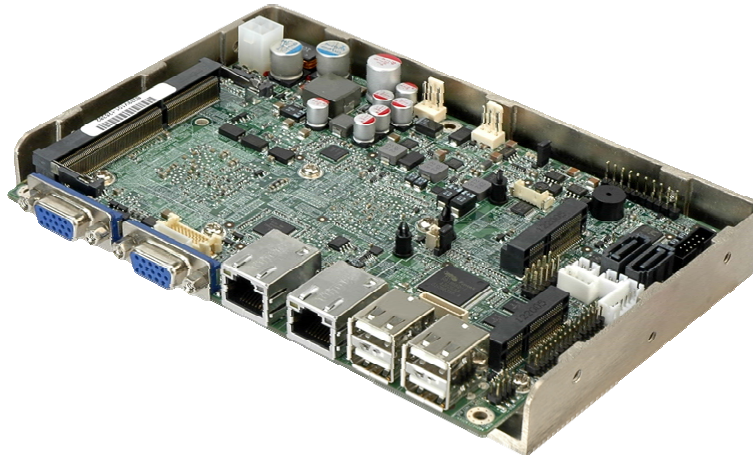
Chapter

1

# Introduction

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## 1.1 Introduction



**Figure 1-1: NANO-CV-D25502/N26002**

The NANO-CV-D25502/N26002 EPIC motherboard is an Intel® Atom™ D2550/N2600 processor platform that supports one 1066 MHz or 800 MHz DDR3 SO-DIMM memory. The NANO-CV-D25502/N26002 supports dual VGA display output and comes with a LVDS connector supporting 24-bit or 18-bit LVDS screens. Maximum six USB ports, two SATA 3Gb/s connectors, two PCIe Mini card slots, four COM ports, and one audio connector provide flexible expansion options.

## 1.2 Model Variations

The model variations of the NANO-CV-D25502/N26002 are listed below.

Model No.	CPU
NANO-CV-D25502-R10	Intel® Atom™ D2550 1.86 GHz
NANO-CV-N26002-R10	Intel® Atom™ N2600 1.6 GHz
NANO-CV-N28002-R10	Intel® Atom™ N2800 1.86 GHz

**Table 1-1: NANO-CV-D25502/N26002 Model Variations**

## 1.3 Features

Some of the NANO-CV-D25502/N26002 motherboard features are listed below:

- EPIC form factor

## NANO-CV-D25502/N26002 EPIC SBC

- Supports dual VGA and 18/24-bit LVDS interface for dual display
- 1066/800 MHz DDR3 SO-DIMM supports up to 4 GB
- Easy-assembly thermal design by heat sink enclosure
- Wide range power input (9V~28V)
- Full-size PCIe Mini card slot with mSATA support
- Dual GbE
- RoHS compliant

### 1.4 Connectors

The connectors on the NANO-CV-D25502/N26002 are shown in the figure below.

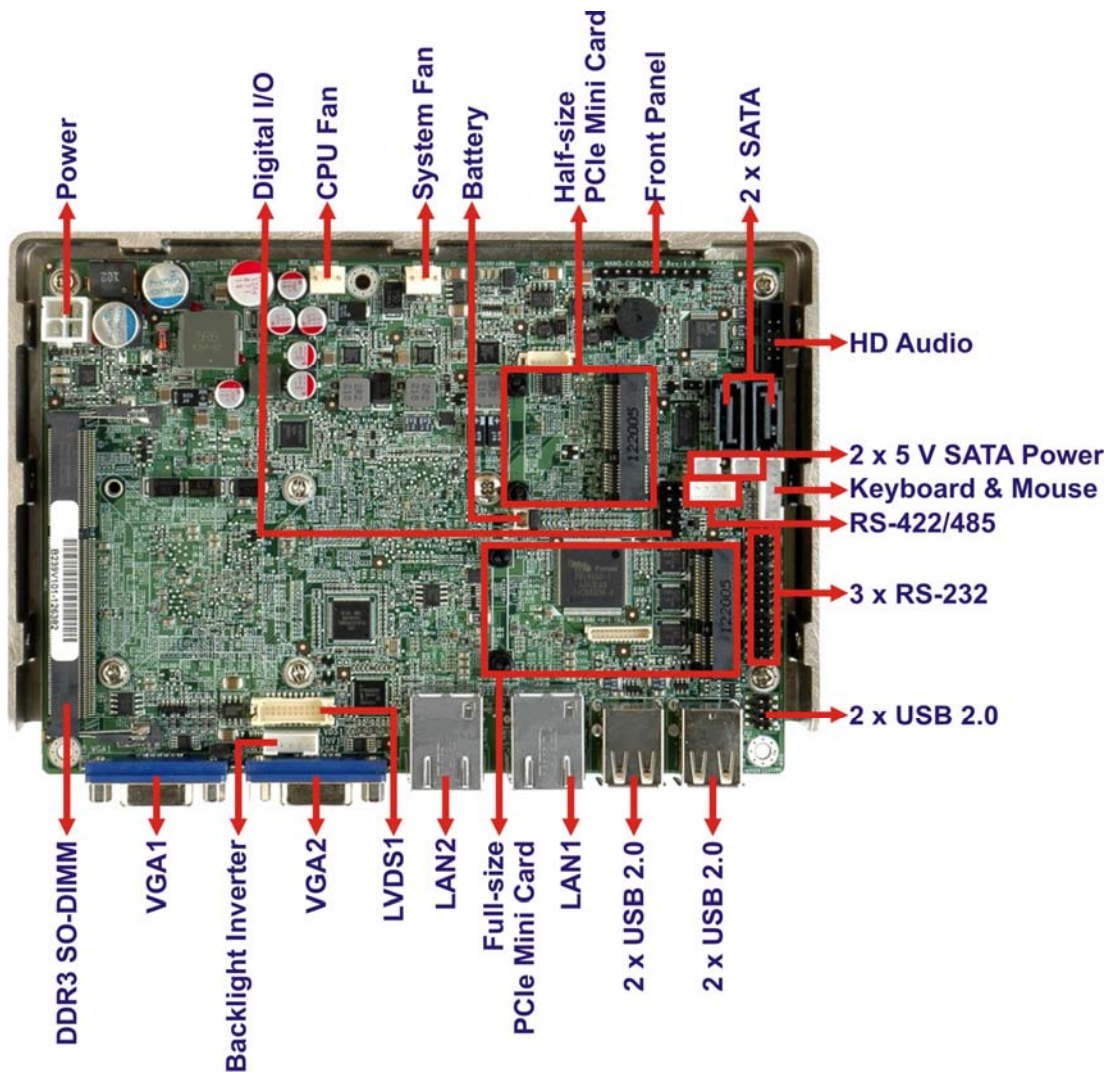
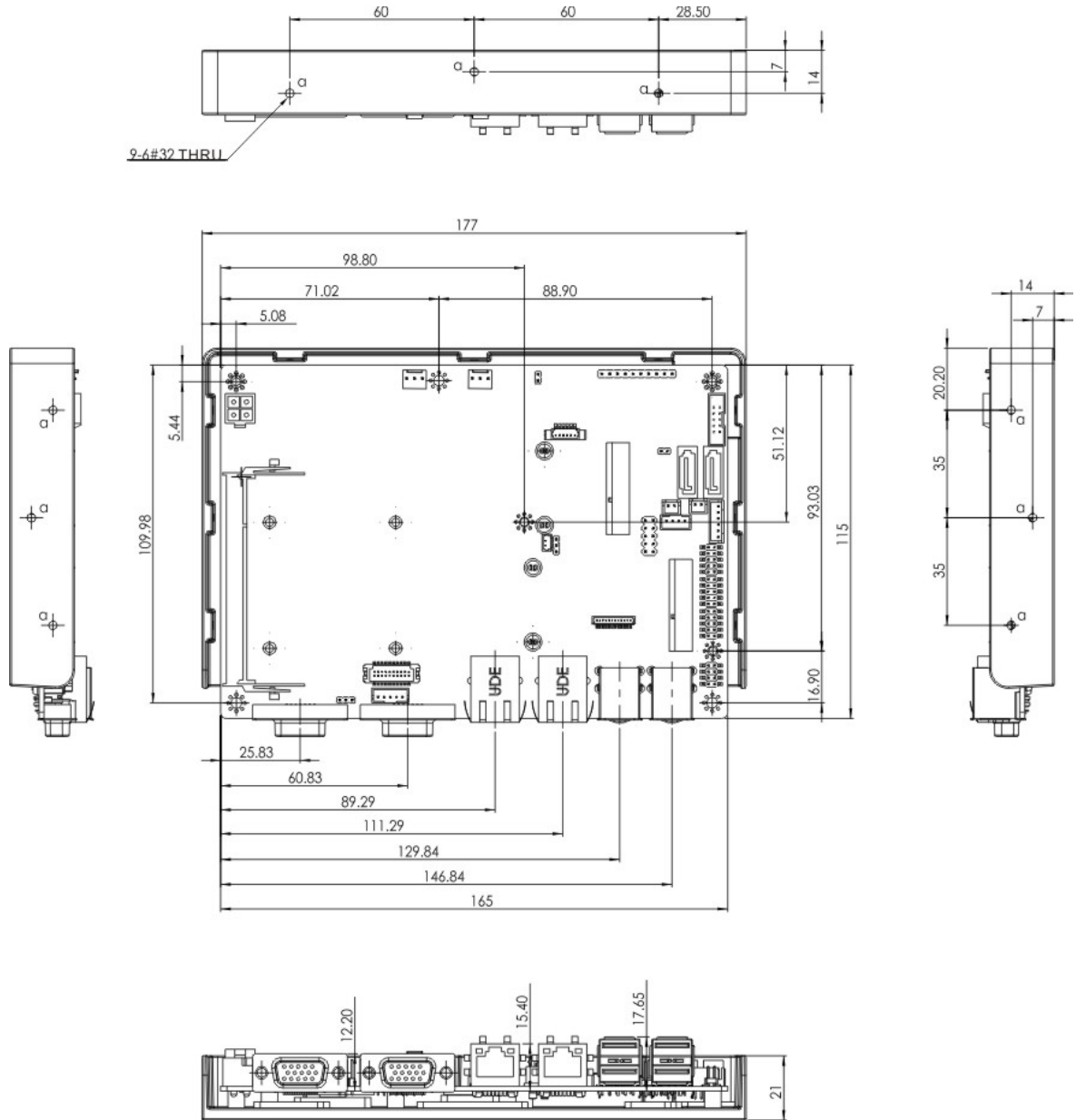


Figure 1-2: Connectors



## 1.5 Dimensions

The main dimensions of the NANO-CV-D25502/N26002 are shown in the diagram below.



NANO-CV-D25502/N26002 EPIC SBC

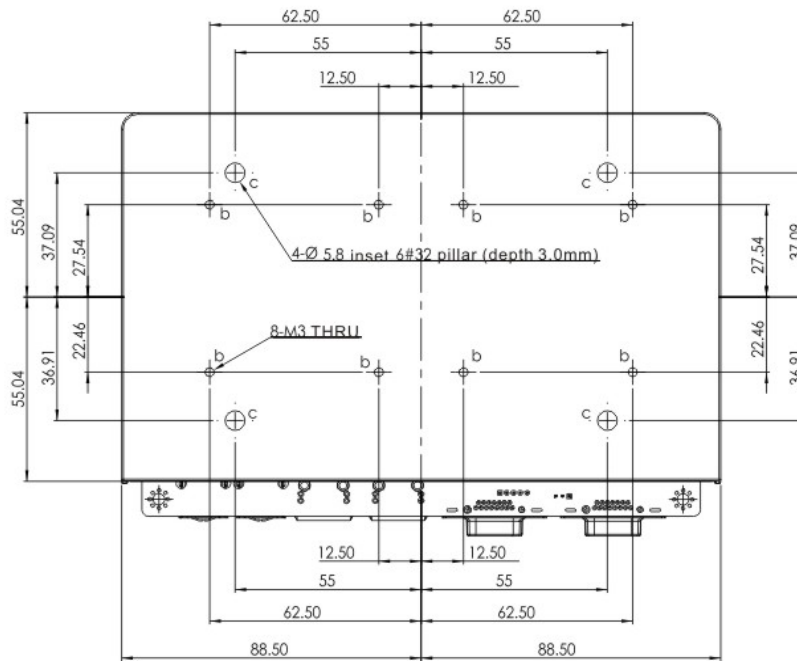


Figure 1-3: NANO-CV-D25502/N26002 Dimensions (mm)



### 1.6 Data Flow

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

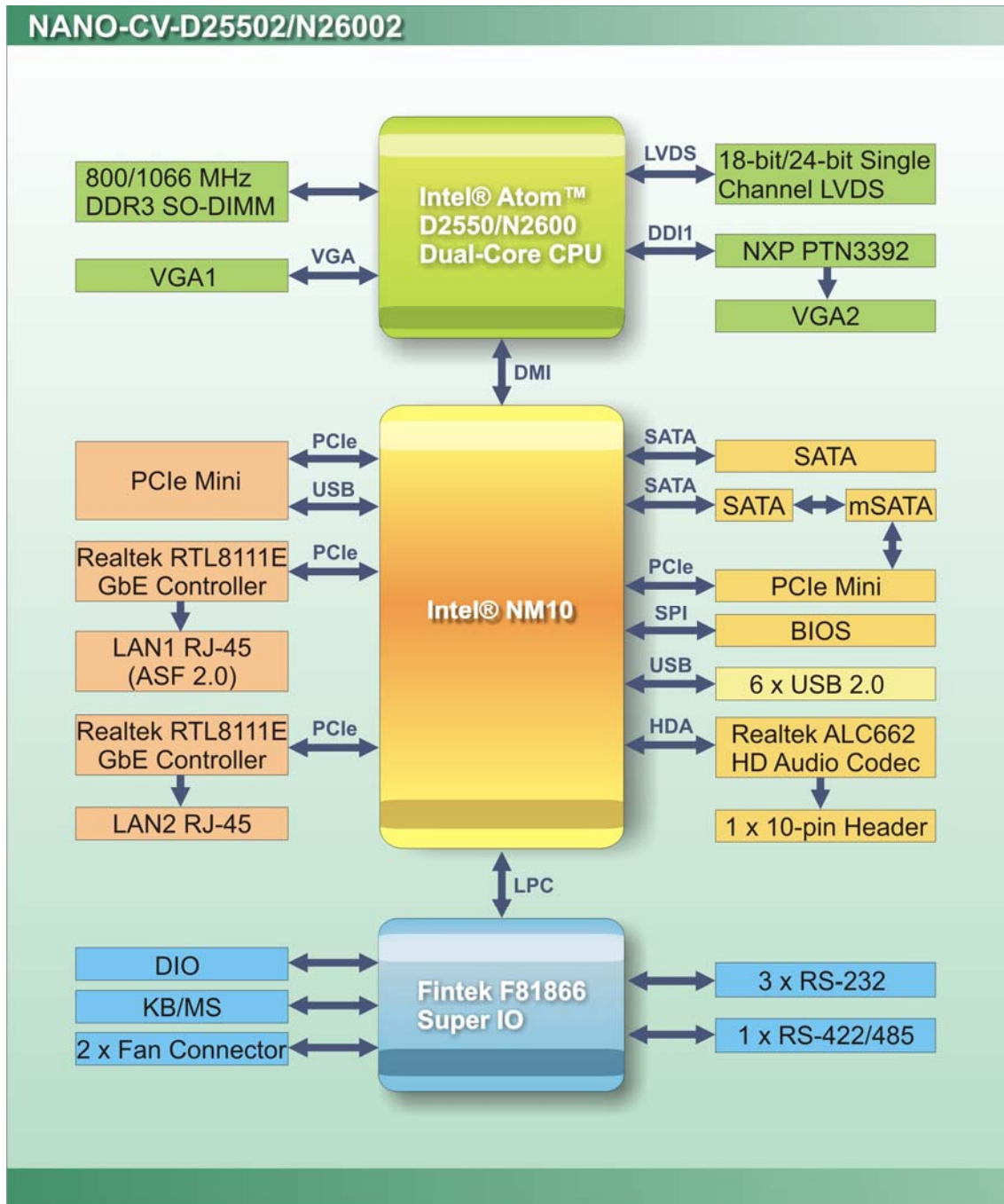


Figure 1-4: Data Flow Diagram

## NANO-CV-D25502/N26002 EPIC SBC

### 1.7 Technical Specifications

The NANO-CV-D25502/N26002 technical specifications are listed below.

Specification/Model	NANO-CV-D25502/N26002
Form Factor	EPIC
System CPU	1.86 GHz Intel® Atom™ D2550 dual-core CPU 1.6 GHz Intel® Atom™ N2600 dual-core CPU 1.86 GHz Intel® Atom™ N2800 dual-core CPU (optional)
System Chipset	Intel® NM10
Memory	D2550/N2800: One 1066 MHz DDR3 SO-DIMM support (up to 4 GB) N2600: One 800 MHz DDR3 SO-DIMM support (up to 2 GB)
Graphics Engine	D2550/N2800: Intel® GMA 3650 with 640 MHz graphics core speed N2600: Intel® GMA 3600 with 400 MHz graphics core speed
Display	Dual display supported First VGA is integrated in the CPU (1920 x 1200) Second VGA is driven by the NXP PTN3392 (1920 x 1200) One LVDS is integrated in the CPU: <ul style="list-style-type: none"> <li>▪ D2550: 24-bit single-channel LVDS up to 1440 x 900</li> <li>▪ N2600/N2800: 18-bit single-channel LVDS up to 1366 x 768</li> </ul>
Ethernet	Two Realtek RTL8111E PCIe GbE controllers (LAN1 with ASF 2.0 support)
BIOS	UEFI BIOS
Super I/O Controller	Fintek F81866
Watchdog Timer	Software programmable supports 1~255 sec. system reset
Expansion	One full-size PCIe Mini card slot with mSATA support (SATA1 and mSATA share SATA signal) One half-size PCIe Mini card slot
Audio	Realtek ALC662 HD Audio codec One internal audio connector (10-pin box header)

<b>Specification/Model</b>	<b>NANO-CV-D25502/N26002</b>
<b>COM</b>	Three RS-232 One RS-422/485
<b>Digital I/O</b>	One 8-bit digital input/output connector (4-bit input/4-bit output)
<b>Fan</b>	One 3-pin CPU fan connector One 3-pin system fan connector
<b>Front Panel</b>	One 10-pin header (power LED, HDD LED, power button, reset button)
<b>Keyboard/Mouse</b>	One internal 6-pin wafer connector
<b>SATA</b>	Two SATA 3Gb/s ports with 5V power connectors (SATA1 and mSATA share SATA signal)
<b>USB</b>	Six USB 2.0/1.1 devices supported: Four by external connectors Two by on-board pin header
<b>Power Supply</b>	9V~28V AT and ATX support One internal 4-pin (2x2) power connector
<b>Power Consumption</b>	12V @ 1.59 A (1.86 GHz Intel® Atom™ D2550 CPU with 4 GB 1333 MHz DDR3 SO-DIMM) 12V @ 1.23 A (1.6 GHz Intel® Atom™ N2600 CPU with 4 GB 1333 MHz DDR3 SO-DIMM)
<b>Operating Temperature</b>	D2550: -20°C ~ 60°C with free air; -20°C ~ 70°C with force air N2600/N2800: -20°C ~ 70°C with free air; -20°C ~ 75°C with force air
<b>Storage Temperature</b>	D2550: -30°C ~ 80°C N2600/N2800: -30°C ~ 85°C
<b>Humidity (Operating)</b>	5% ~ 95% (non-condensing)
<b>Dimensions</b>	115 mm x 165 mm
<b>Weight (GW/NW)</b>	850 g/350 g

**Table 1-2: NANO-CV-D25502/N26002 Specifications**

Chapter

**2**

# Packing List

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## 2.1 Anti-static Precautions

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### WARNING!

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

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Make sure to adhere to the following guidelines:

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

## 2.2 Unpacking Precautions

When the NANO-CV-D25502/N26002 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.



## NANO-CV-D25502/N26002 EPIC SBC







### 2.3 Packing List



#### NOTE:

If any of the components listed in the checklist below are missing, do not proceed with the installation. Contact the IEI reseller or vendor the NANO-CV-D25502/N26002 was purchased from or contact an IEI sales representative directly by sending an email to [sales@ieiworld.com](mailto:sales@ieiworld.com).

The NANO-CV-D25502/N26002 is shipped with the following components:

Quantity	Item and Part Number	Image
1	NANO-CV-D25502/N26002 motherboard	
1	SATA and power cable (P/N: 32801-000201-300-RS)	
1	Audio cable (P/N: 32000-072100-RS)	
1	RS-232 cable (P/N: 32200-000049-RS)	
1	Power cable (P/N: 32100-087100-RS)	
1	Mini jumper pack	




Quantity	Item and Part Number	Image
1	One Key Recovery CD	
1	Utility CD	
1	Quick Installation Guide	

Table 2-1: Packing List

## 2.4 Optional Items

The following are optional components which may be separately purchased:




Item and Part Number	Image
Dual USB cable (wo bracket) (P/N: 32000-070301-RS)	
RS-422/485 cable (200 mm) (P/N: 32205-003800-300-RS)	
PS/2 KB/MS Y-cable (P/N: 32000-023800-RS)	

Table 2-2: Optional Items

Chapter

**3**

# Connectors

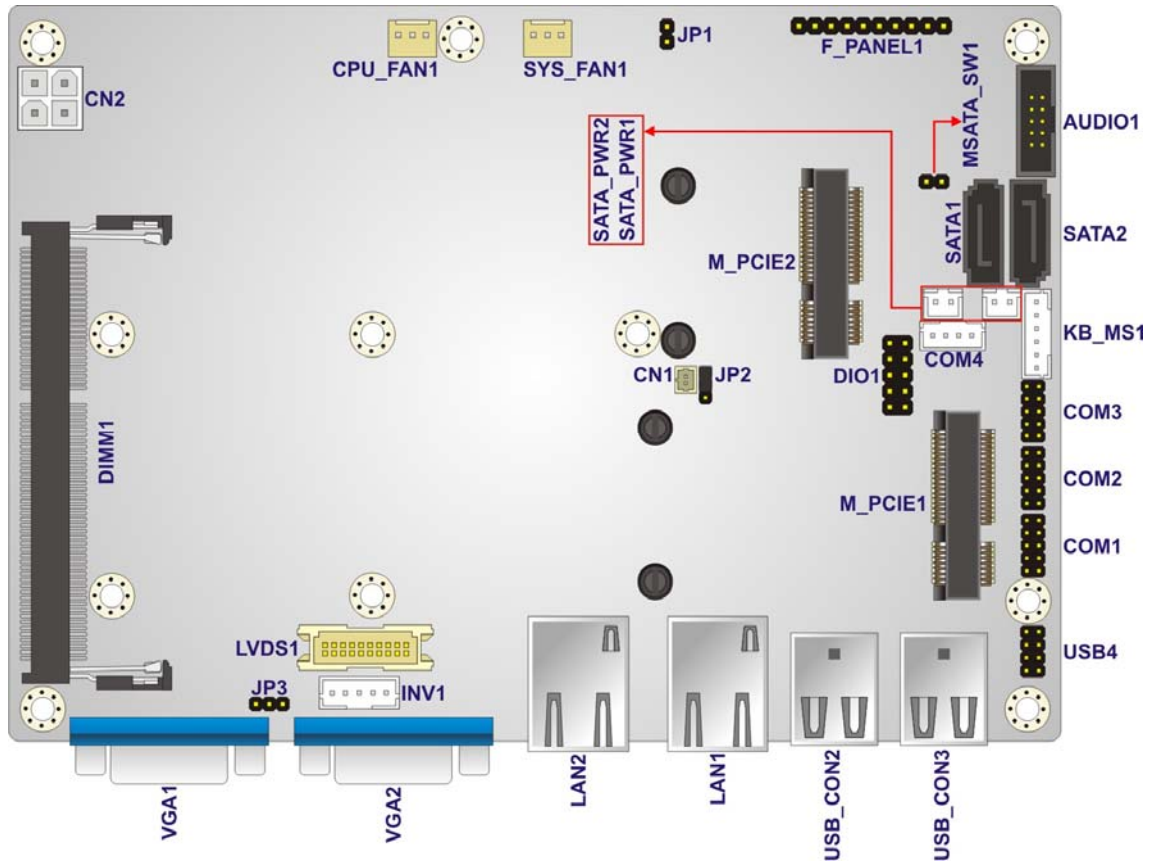
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### 3.1 Peripheral Interface Connectors

This chapter details all the jumpers and connectors.

#### 3.1.1 NANO-CV-D25502/N26002 Layout

The figure below shows all the connectors and jumpers.



**Figure 3-1: Connectors and Jumpers**

#### 3.1.2 Peripheral Interface Connectors

The table below lists all the connectors on the board.

Connector	Type	Label
5 V SATA power connectors	2-pin wafer	SATA_PWR1, SATA_PWR2
Audio connector	10-pin box header	AUDIO1

## NANO-CV-D25502/N26002 EPIC SBC

Connector	Type	Label
Backlight inverter connector	5-pin wafer	INV1
Battery connector	2-pin wafer	CN1
Digital Input/Output (DIO) connector	10-pin header	DIO1
Fan connectors	3-pin wafer	CPU_FAN1, SYS_FAN2
Front panel connector	10-pin header	F_PANEL1
Keyboard and mouse connector	6-pin wafer	KB_MS1
LVDS connector	20-pin crimp	LVDS1
PCIe Mini card slots	52-pin PCIe Mini	M_PCIE1, M_PCIE2
Power connector (9V~28V)	4-pin connector	CN2
RS-232 serial port connectors	10-pin header	COM1, COM2, COM3
RS-422/485 serial port connector	4-pin wafer	COM4
Serial ATA (SATA) drive connectors	7-pin SATA	SATA1, SATA2
SO-DIMM connector	SO-DIMM connector	DIMM1
USB 2.0 connector	8-pin header	USB4

**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
Ethernet connectors	RJ-45	LAN1, LAN2
USB connectors	USB 2.0	USB_CON2, USB_CON3
VGA connectors	15-pin female	VGA1, VGA2

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



### 3.2 Internal Peripheral Connectors

The section describes all of the connectors on the NANO-CV-D25502/N26002.

#### 3.2.1 5 V SATA Power Connectors

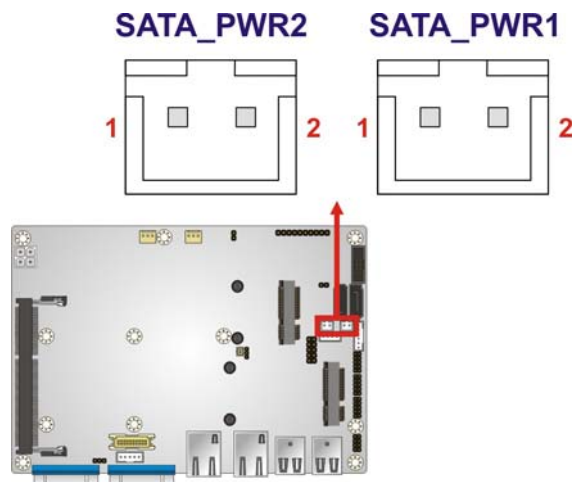
**CN Label:** SATA\_PWR1, SATA\_PWR2

**CN Type:** 2-pin wafer

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

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

Use the 5 V SATA power connectors to connect to SATA device power connection.



**Figure 3-2: 5 V SATA Power Connector Locations**

Pin No.	Description
1	+5V
2	Ground

**Table 3-3: 5 V SATA Power Connector Pinouts**

#### 3.2.2 Audio Connector

**CN Label:** AUDIO1

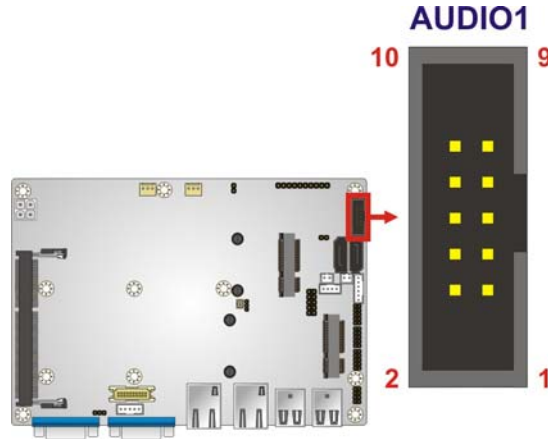
**CN Type:** 10-pin box header

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

**CN Pinouts:** See **Table 3-4**

## NANO-CV-D25502/N26002 EPIC SBC

The 10-pin audio connector is connected to external audio devices including speakers and microphones for the input and output of audio signals to and from the system.



**Figure 3-3: Audio Connector Location**

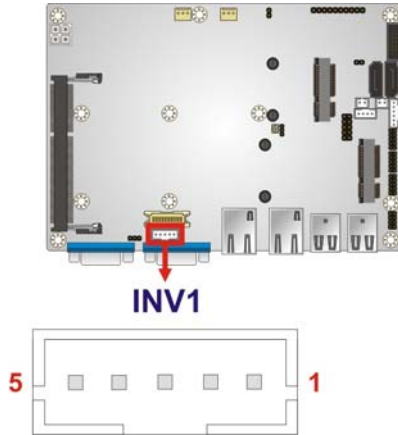
Pin	Description	Pin	Description
1	SPK_R	2	LINE1_R
3	AUD_GND	4	AUD_GND
5	SPK_L	6	LINE1_L
7	AUD_GND	8	AUD_GND
9	MIC1_R	10	MIC1_L

**Table 3-4: Audio Connector Pinouts**

### 3.2.3 Backlight Inverter Connector

- CN Label:** INV1
- CN Type:** 5-pin wafer
- CN Location:** See **Figure 3-4**
- CN Pinouts:** See **Table 3-5**

The backlight inverter connector provides the backlight on the LCD display connected to the NANO-CV-D25502/N26002 with +12V of power.



**Figure 3-4: Backlight Inverter Connector Location**

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

**Table 3-5: Backlight Inverter Connector Pinouts**

### 3.2.4 Battery Connector



**CAUTION:**

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

Dispose of used batteries according to instructions and local regulations.

- CN Label:** CN1
- CN Type:** 2-pin wafer
- CN Location:** See **Figure 3-5**
- CN Pinouts:** See **Table 3-6**

## NANO-CV-D25502/N26002 EPIC SBC

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

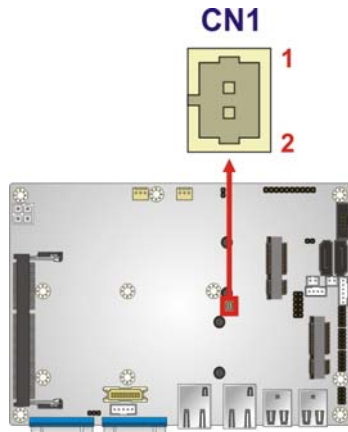


Figure 3-5: Battery Connector Location

Pin	Description
1	Battery+
2	GND

Table 3-6: Battery Connector Pinouts

### 3.2.5 Digital Input/Output (DIO) Connector

- CN Label:** DIO1
- CN Type:** 10-pin header
- CN Location:** See Figure 3-6
- CN Pinouts:** See Table 3-7

The digital input/output connector is managed through a Super I/O chip. The DIO connector pins are user programmable.

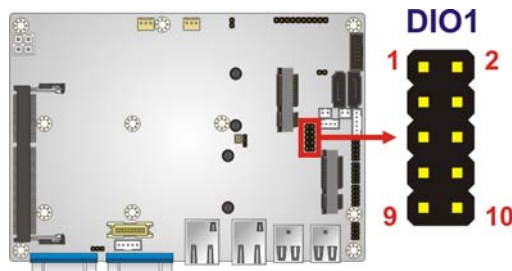


Figure 3-6: Digital I/O Connector Location

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

**Table 3-7: Digital I/O Connector Pinouts**

### 3.2.6 Fan Connectors

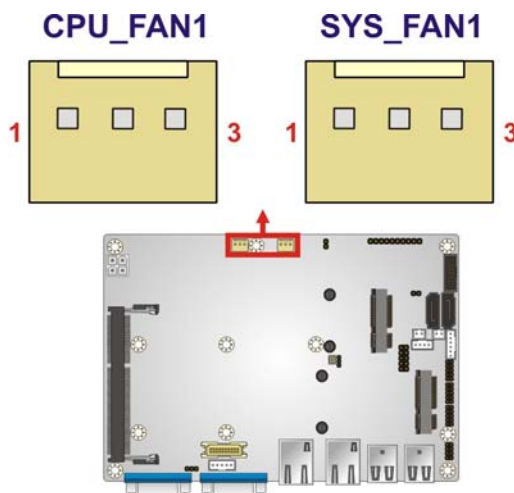
**CN Label:** CPU\_FAN1, SYS\_FAN1

**CN Type:** 3-pin wafer

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

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

The fan connectors attach to the CPU/system cooling fans.



**Figure 3-7: Fan Connector Locations**

PIN NO.	DESCRIPTION
1	FANIO
2	+12V (PWM)
3	Ground

**Table 3-8: Fan Connector Pinouts**

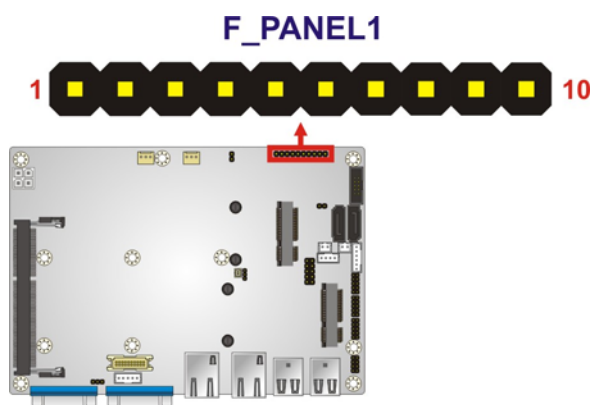


## NANO-CV-D25502/N26002 EPIC SBC

### 3.2.7 Front Panel Connector

- CN Label:** F\_PANEL1
- CN Type:** 10-pin header
- CN Location:** See **Figure 3-8**
- CN Pinouts:** See **Table 3-9**

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



**Figure 3-8: Front Panel Connector Location**

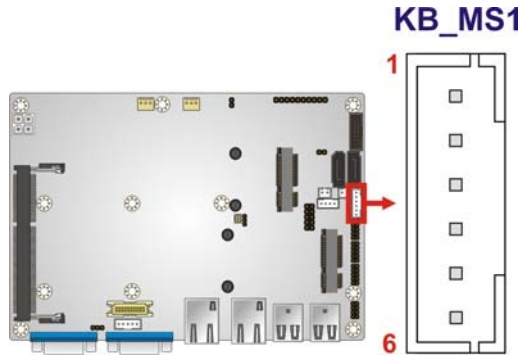
Function	Pin	Description	Function	Pin	Description
	1	NC	Power LED	6	PWRLED
Power Button	2	PWRBTSW#		7	PWRLED
	3	GND		8	GND
HDD LED	4	+V5S	Reset Button	9	RESET+
	5	HDD_LED-		10	GND

**Table 3-9: Front Panel Connector Pinouts**

### 3.2.8 Keyboard/Mouse Connector

- CN Label:** KB\_MS1
- CN Type:** 6-pin wafer
- CN Location:** See **Figure 3-9**
- CN Pinouts:** See **Table 3-10**

The keyboard and mouse connector can be connected to a standard PS/2 cable or PS/2 Y-cable to add keyboard and mouse functionality to the system.



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

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

**Table 3-10: Keyboard/Mouse Connector Pinouts**

### 3.2.9 LVDS1 Connector

- CN Label:** LVDS1
- CN Type:** 20-pin crimp
- CN Location:** See **Figure 3-10**
- CN Pinouts:** See **Table 3-11**

The 20-pin LVDS LCD connector can be connected to an 18-bit/24-bit single-channel LVDS panel.

NANO-CV-D25502/N26002 EPIC SBC

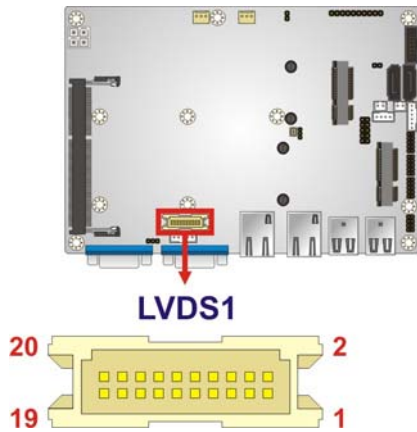


Figure 3-10: LVDS1 Connector Location

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

Table 3-11: LVDS1 Connector Pinouts

### 3.2.10 PCIe Mini Card Slots

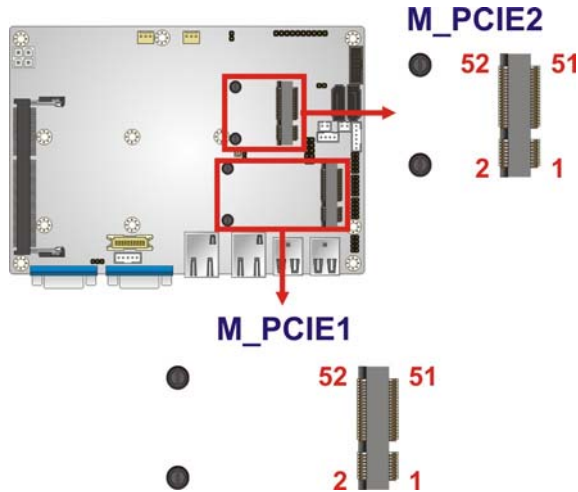
- CN Label:** M\_PCIE1, M\_PCIE2
- CN Type:** 52-pin PCIe Mini card slot
- CN Location:** See Figure 3-11
- CN Pinouts:** See Table 3-12

The **M\_PCIE1** slot can be connected to a full-size PCIe Mini card while the **M\_PCIE2** slot can be connected to a half-size PCIe Mini card.



**NOTE:**

The **M\_PCIE1** slot supports mSATA devices. However, the **SATA1** connector will be disabled when an mSATA device is installed to the **M\_PCIE1** slot.



**Figure 3-11: PCIe Mini Card Slot Locations**

Pin	Description	Pin	Description
1	PCIE_WAKE#	2	VCC3
3	N/C	4	GND
5	N/C	6	1.5V
7	N/C	8	N/C
9	GND	10	N/C
11	PCIE_CLK#	12	N/C
13	PCIE_CLK	14	N/C
15	GND	16	N/C
17	N/C	18	GND
19	N/C	20	N/C
21	GND	22	PCIRST#
23	PCIE_RXN	24	VCC3
25	PCIE_RXP	26	GND
27	GND	28	1.5V

## NANO-CV-D25502/N26002 EPIC SBC

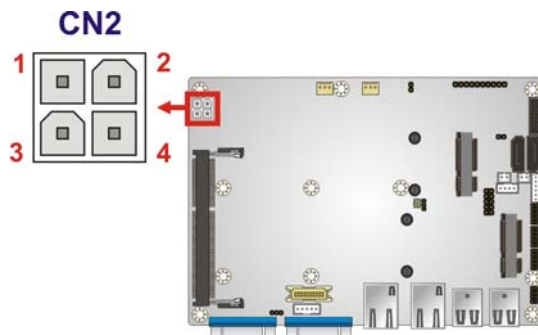
Pin	Description	Pin	Description
29	GND	30	SMBCLK
31	PCIE_TXN	32	SMBDATA
33	PCIE_TXP	34	GND
35	GND	36	USB D-
37	GND	38	USB D+
39	VCC3	40	GND
41	VCC3	42	N/C
43	GND	44	N/C
45	N/C	46	N/C
47	N/C	48	1.5V
49	N/C	50	GND
51	M-SATA Detect	52	VCC3

**Table 3-12: PCIe Mini Card Slot Pinouts**

### 3.2.11 Power Connector (9V~28V)

- CN Label:** CN2
- CN Type:** 4-pin connector
- CN Location:** See **Figure 3-12**
- CN Pinouts:** See **Table 3-13**

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



**Figure 3-12: Power Connector Location**



Pin	Description	Pin	Description
1	GND	2	GND
3	PWR	4	PWR

**Table 3-13: Power Connector Pinouts**

### 3.2.12 RS-232 Serial Port Connectors

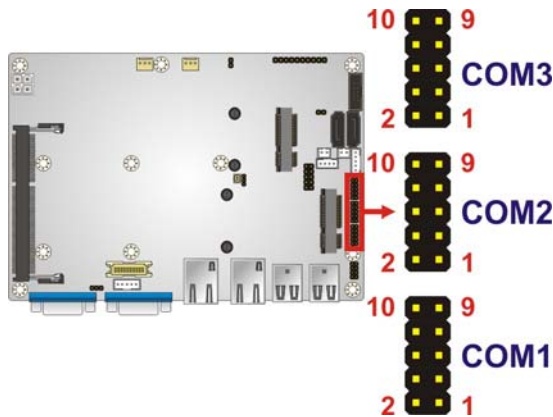
**CN Label:** COM1, COM2, COM3

**CN Type:** 10-pin header

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

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

Each of these connectors provides RS-232 connections.



**Figure 3-13: RS-232 Serial Port Connector Locations**

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

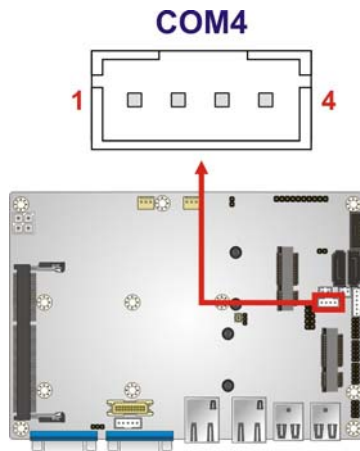
**Table 3-14: RS-232 Serial Port Connector Pinouts**

**NANO-CV-D25502/N26002 EPIC SBC**

**3.2.13 RS-422/485 Serial Port Connector**

- CN Label:** COM4
- CN Type:** 4-pin wafer
- CN Location:** See **Figure 3-14**
- CN Pinouts:** See **Table 3-15**

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



**Figure 3-14: RS-422/485 Connector Location**

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

**Table 3-15: RS-422/485 Connector Pinouts**

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

RS-422 Pinouts	RS-485 Pinouts

**Table 3-16: DB-9 RS-422/485 Pinouts**

### 3.2.14 SATA Drive Connectors

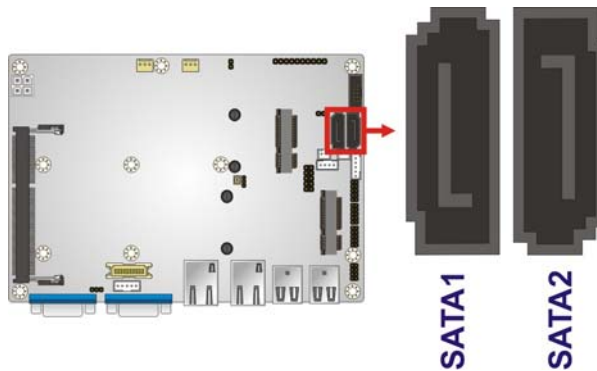
- CN Label:** SATA1, SATA2
- CN Type:** 7-pin SATA drive connector
- CN Location:** See **Figure 3-15**
- CN Pinouts:** See **Table 3-17**

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



**NOTE:**

The **SATA1** connector will be disabled when an mSATA device is installed to the **M\_PCIE1** slot.



**Figure 3-15: SATA Drive Connector Locations**

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

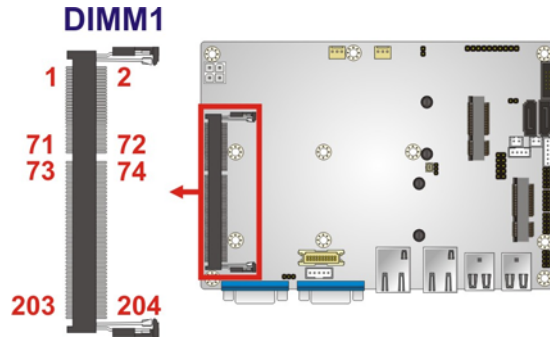
**Table 3-17: SATA Drive Connector Pinouts**

**NANO-CV-D25502/N26002 EPIC SBC**

**3.2.15 SO-DIMM Connector**

- CN Label:** DIMM1
- CN Type:** 204-pin DDR3 SO-DIMM connector
- CN Location:** See **Figure 3-16**

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

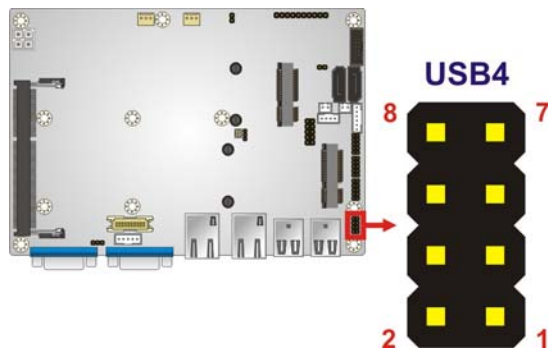


**Figure 3-16: SO-DIMM Connector Location**

**3.2.16 USB Connector**

- CN Label:** USB4
- CN Type:** 8-pin header
- CN Location:** See **Figure 3-17**
- CN Pinouts:** See **Table 3-18**

The USB connector provides connectivity to two USB 1.1/2.0 ports.



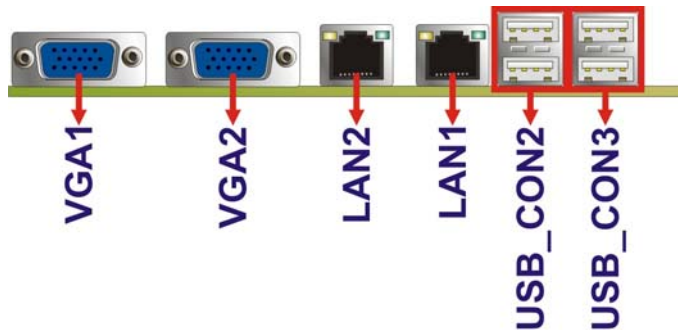
**Figure 3-17: USB Connector Location**

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

**Table 3-18: USB Connector Pinouts**

### 3.3 External Peripheral Interface Connector Panel

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



**Figure 3-18: External Peripheral Interface Connector**

#### 3.3.1 Ethernet Connectors

- CN Label:** LAN1, LAN2
- CN Type:** RJ-45 connector
- CN Location:** See **Figure 3-18**
- CN Pinouts:** See **Table 3-19**

The NANO-CV-D25502/N26002 is equipped with two built-in RJ-45 Ethernet controllers. Each controller can connect to the LAN through one RJ-45 LAN connector.

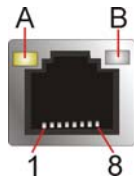
Pin	Description	Pin	Description
1	MDIA3-	5	MDIA2+
2	MDIA3+	6	MDIA1+



**NANO-CV-D25502/N26002 EPIC SBC**

Pin	Description	Pin	Description
3	MDIA1-	7	MDIA0-
4	MDIA2-	8	MDIA0+

**Table 3-19: LAN Pinouts**



**Figure 3-19: RJ-45 Ethernet Connector**

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

**Table 3-20: RJ-45 Ethernet Connector LEDs**

**3.3.2 USB Connectors**

**CN Label:** USB\_CON2, USB\_CON3

**CN Type:** Dual USB port

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

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

The ports connect to both USB 2.0 and USB 1.1 devices.

Pin	Description	Pin	Description
1	VCC	2	DATA-
3	DATA+	4	GND

**Table 3-21: USB Port Pinouts**

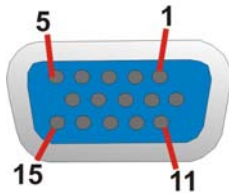
### 3.3.3 VGA Connectors

- CN Label:** VGA1, VGA2
- CN Type:** 15-pin Female
- CN Location:** See **Figure 3-18**
- CN Pinouts:** See **Figure 3-20** and **Table 3-22**

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

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

**Table 3-22: VGA Connector Pinouts**



**Figure 3-20: VGA Connector**

Chapter

4

# Installation

---

## 4.1 Anti-static Precautions

---



### WARNING:

Failure to take ESD precautions during the installation of the NANO-CV-D25502/N26002 may result in permanent damage to the NANO-CV-D25502/N26002 and severe injury to the user.

---

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the NANO-CV-D25502/N26002. Dry climates are especially susceptible to ESD. It is therefore critical that whenever the NANO-CV-D25502/N26002 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 NANO-CV-D25502/N26002, place it on an anti-static pad. This reduces the possibility of ESD damaging the NANO-CV-D25502/N26002.
- **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.

---

## NANO-CV-D25502/N26002 EPIC SBC



### **WARNING:**

The installation instructions described in this manual should be carefully followed in order to prevent damage to the 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 NANO-CV-D25502/N26002 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 NANO-CV-D25502/N26002 on an anti-static pad:
  - When installing or configuring the motherboard, place it on an anti-static pad. This helps to prevent potential ESD damage.
- Turn all power to the NANO-CV-D25502/N26002 off:
  - When working with the NANO-CV-D25502/N26002, 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 NANO-CV-D25502/N26002 **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.

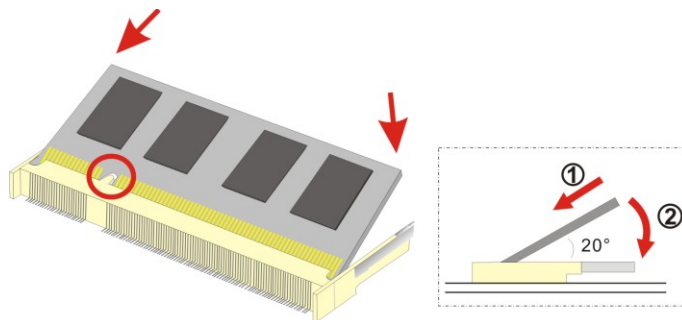


### 4.3 SO-DIMM Installation

**WARNING:**

Using incorrectly specified SO-DIMM may cause permanent damage to the NANO-CV-D25502/N26002. Please make sure the purchased SO-DIMM complies with the memory specifications of the NANO-CV-D25502/N26002. SO-DIMM specifications compliant with the NANO-CV-D25502/N26002 are listed in Chapter 1.

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



**Figure 4-1: SO-DIMM Installation**

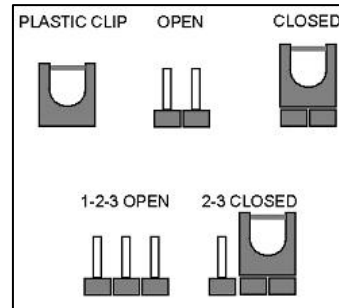
- Step 1:** **Locate the SO-DIMM socket.** Place the NANO-CV-D25502/N26002 on an anti-static pad.
- Step 2:** **Align the SO-DIMM with the socket.** Align the notch on the memory with the notch on the memory socket.
- Step 3:** **Insert the SO-DIMM.** Push the memory in at a 20° angle. (See **Figure 4-1**)
- Step 4:** **Seat the SO-DIMM.** Gently push downwards and the arms clip into place. (See **Figure 4-1**)

## 4.4 Jumper Settings



**NOTE:**

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



The hardware jumpers must be set before installation. Jumpers are shown in **Table 4-1**.

Description	Label	Type
AT/ATX power selection	JP1	2-pin header
Clear CMOS	JP2	3-pin header
LVDS1 voltage selection	JP3	3-pin header
mSATA/PCIe Mini selection	MSATA_SW1	2-pin header

**Table 4-1: Jumpers**

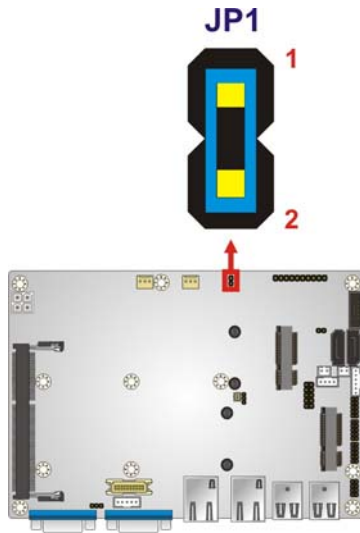
### 4.4.1 AT/ATX Power Selection Jumper

- Jumper Label:** JP1
- Jumper Type:** 2-pin header
- Jumper Settings:** See **Table 4-2**
- Jumper Location:** See **Figure 4-2**

The AT/ATX power selection jumper specifies the system power mode as AT or ATX.

Setting	Description
Short 1-2	Use ATX power (Default)
Off	Use AT power

**Table 4-2: AT/ATX Power Selection Jumper Settings**



**Figure 4-2: AT/ATX Power Selection Jumper Location**

#### 4.4.2 Clear CMOS Jumper

- Jumper Label:** JP2
- Jumper Type:** 3-pin header
- Jumper Settings:** See Table 4-3
- Jumper Location:** See Figure 4-3

To reset the BIOS, move the jumper to the "Clear BIOS" position for 3 seconds or more, and then move back to the default position.

Setting	Description
Short 1-2	Normal (Default)
Short 2-3	Clear BIOS

**Table 4-3: Clear CMOS Jumper Settings**

NANO-CV-D25502/N26002 EPIC SBC

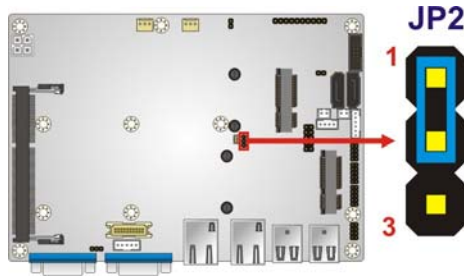


Figure 4-3: Clear CMOS Jumper Location

4.4.3 LVDS1 Voltage Selection



**WARNING:**

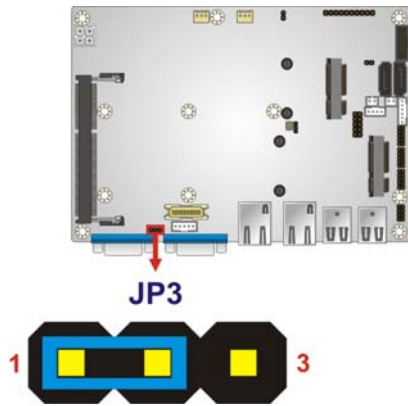
Permanent damage to the screen and NANO-CV-D25502/N26002 may occur if the wrong voltage is selected with this jumper. Please refer to the user guide that came with the monitor to select the correct voltage.

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

Sets the voltage provided to the monitor by LVDS1.

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

Table 4-4: LVDS1 Voltage Selection Jumper Settings



**Figure 4-4: LVDS1 Voltage Selection Jumper Location**

#### 4.4.4 mSATA/PCIe Mini Selection

- Jumper Label:** MSATA\_SW1
- Jumper Type:** 2-pin header
- Jumper Settings:** See Table 4-5
- Jumper Location:** See Figure 4-5

The mSATA/PCIe Mini mode selection jumper specifies the M\_PCIE1 connector as MSATA or PCIe Mini mode.

Setting	Description
Off	Auto detection (Default)
Short 1-2	mSATA enable

**Table 4-5: mSATA/PCIe Mini Mode Selection Jumper Settings**



**Figure 4-5: mSATA/PCIe Mini Mode Selection Jumper Location**



## NANO-CV-D25502/N26002 EPIC SBC

### 4.5 Chassis Installation

#### 4.5.1 Heat Sink Enclosure

**WARNING:**

Never run the NANO-CV-D25502/N26002 without the heat sink secured to the board. The heat sink ensures the system remains cool and does not need addition heat sinks to cool the system.

---

**WARNING:**

When running the NANO-CV-D25502/N26002, do not put the NANO-CV-D25502/N26002 directly on a surface that can not dissipate system heat, especially the wooden or plastic surface. It is highly recommended to run the NANO-CV-D25502/N26002

- on a heat dissipation surface or
  - using copper pillars to hold the board up from the chassis
- 

When the NANO-CV-D25502/N26002 is shipped it is secured to a heat sink with eight retention screws. If the NANO-CV-D25502/N26002 must be removed from the heat sink, the eight retention screws must be removed.

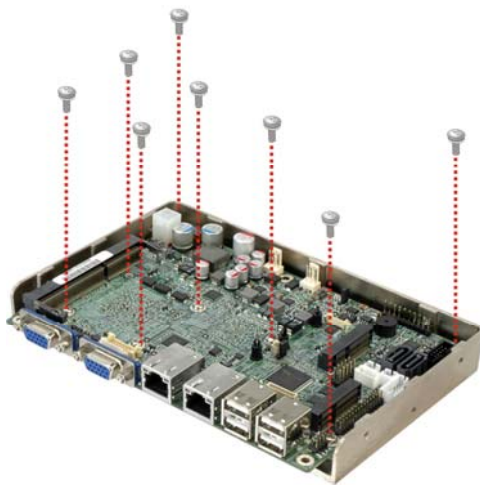
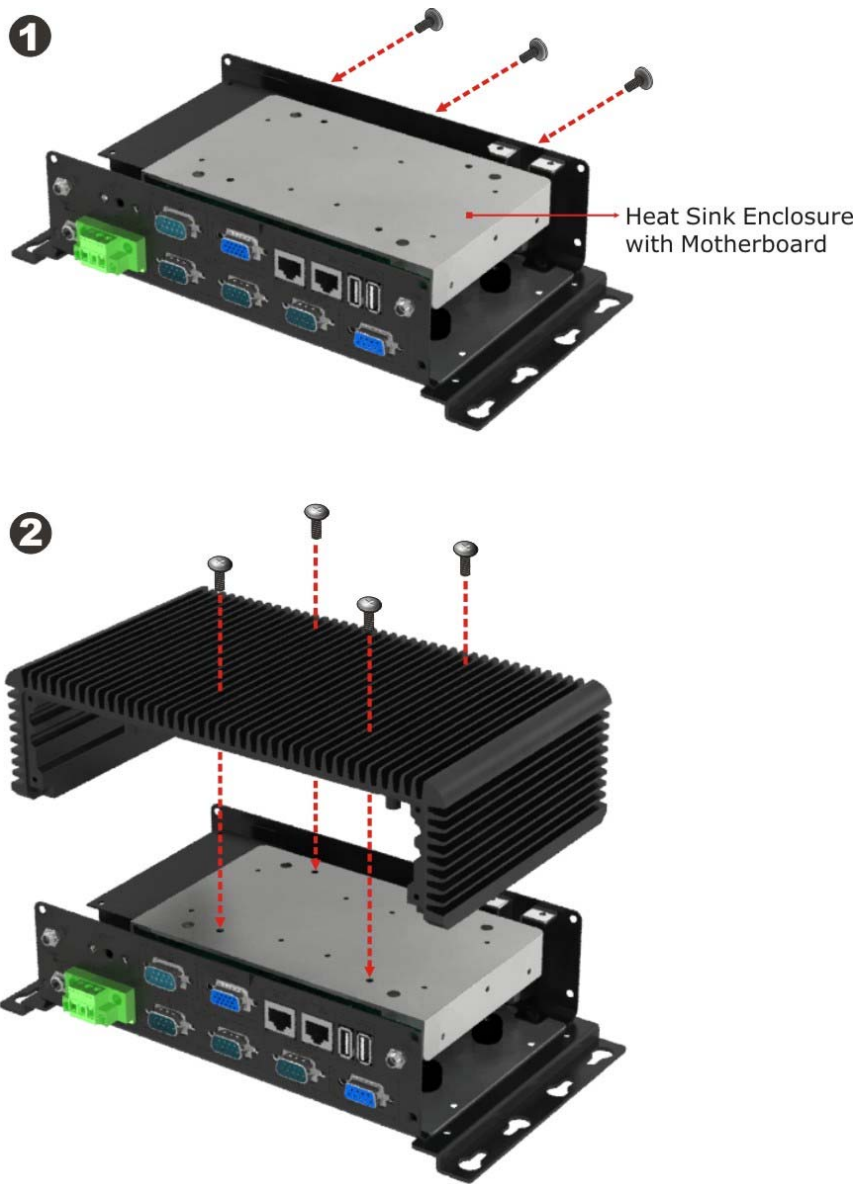


Figure 4-6: Heat Sink Retention Screws

### 4.5.2 Motherboard Installation

Each side of the heat sink enclosure has several screw holes allowing the NANO-CV-D25502/N26002 to be mounted into a chassis (please refer to **Figure 1-3** for the detailed dimensions). The user can design or select a chassis that has screw holes matching up with the holes on the heat sink enclosure for installing the NANO-CV-D25502/N26002. The following diagram shows an example of motherboard installation.



**Figure 4-7: Motherboard Installation Example**

## NANO-CV-D25502/N26002 EPIC SBC

### 4.6 Internal Peripheral Device Connections

This section outlines the installation of peripheral devices to the on-board connectors.

#### 4.6.1 AT/ATX Power Connection

Follow the instructions below to connect the NANO-CV-D25502/N26002 to an AT or ATX power supply.



#### **WARNING:**

Disconnect the power supply power cord from its AC power source to prevent a sudden power surge to the NANO-CV-D25502/N26002.

---

**Step 1:** **Locate the power cable.** The power cable is shown in the packing list in Chapter 2.

**Step 2:** **Connect the Power Cable to the Motherboard.** Connect the 4-pin (2x2) Molex type power cable connector to the power connector on the motherboard. See Figure 4-8.

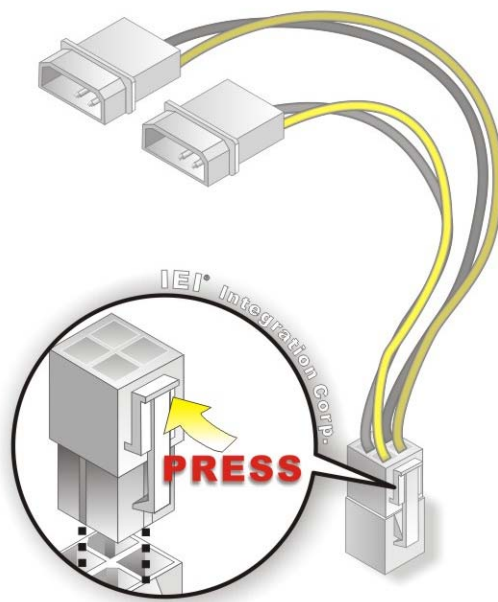
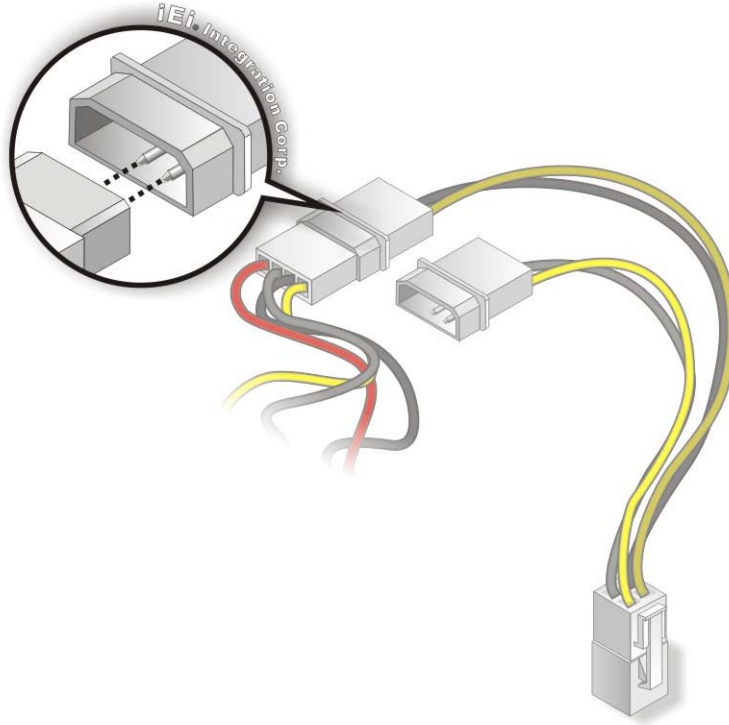


Figure 4-8: Power Cable to Motherboard Connection

**Step 3: Connect Power Cable to Power Supply.** Connect one of the 4-pin (1x4) Molex type power cable connectors to an AT/ATX power supply. See **Figure 4-9**.



**Figure 4-9: Connect Power Cable to Power Supply**

#### 4.6.2 Audio Kit Installation

The Audio Kit that came with the NANO-CV-D25502/N26002 connects to the 10-pin audio connector on the NANO-CV-D25502/N26002. The audio kit consists of three audio jacks. One audio jack, Mic In, connects to a microphone. The remaining two audio jacks, Line-In and Line-Out, connect to two speakers. To install the audio kit, please refer to the steps below:

**Step 1: Locate the audio connector.** The location of the 10-pin audio connector is shown in **Chapter 3**.

**Step 2: Align pin 1.** Align pin 1 on the on-board connector with pin 1 on the audio kit connector. Pin 1 on the audio kit connector is indicated with a white dot. See **Figure 4-10**.



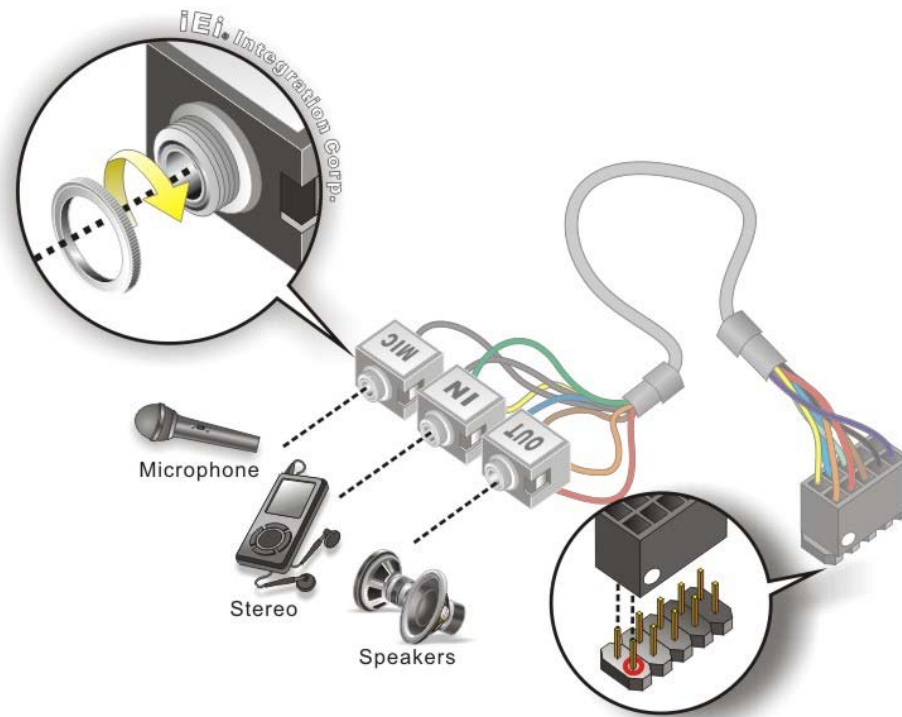


Figure 4-10: Audio Kit Cable Connection

**Step 3:** Connect the audio devices. Connect one speaker to the line-in audio jack, one speaker to the line-out audio jack and a microphone to the mic-in audio jack.

### 4.6.3 LVDS LCD Installation

The NANO-CV-D25502/N26002 can be connected to a TFT LCD screen through the LVDS crimp connectors on the board. To connect a TFT LCD to the NANO-CV-D25502/N26002, please follow the steps below.

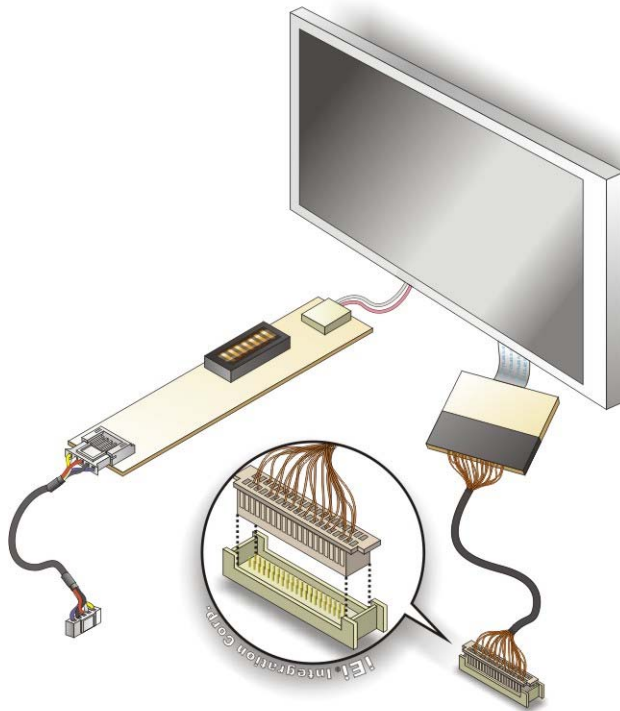
**Step 1:** Locate the connector. The location of the LVDS connector is shown in Chapter 3.

**Step 2:** Insert the cable connector. Insert the connector from the LVDS PCB driving board to the LVDS connector as shown in **Figure 4-11**. When connecting the connectors, make sure the pins are properly aligned.



**WARNING:**

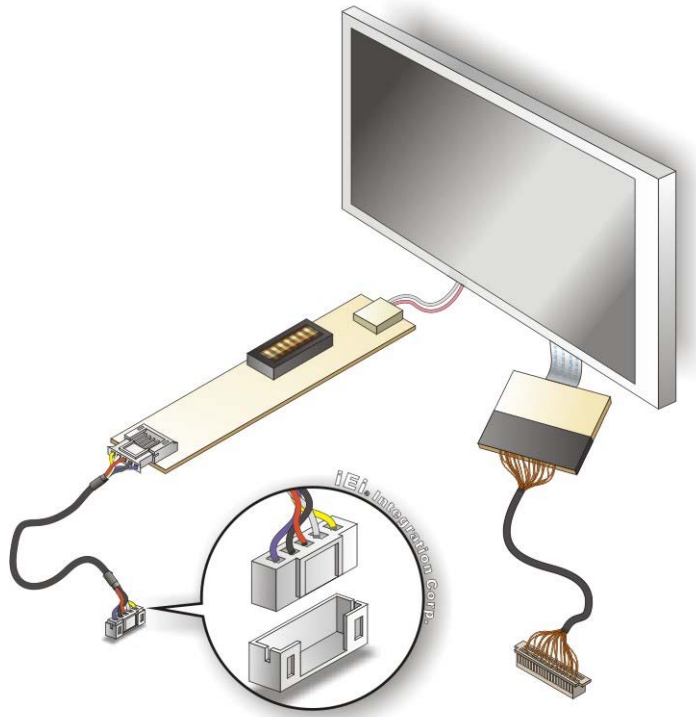
The diagram below is merely for illustration. The configuration and connection of the cables from the TFT LCD screen being installed may be different. Please refer to the installation manual that came with the TFT LCD screen.



**Figure 4-11: LVDS Connector**

**Step 3:** **Locate the backlight inverter connector.** The location of the backlight inverter connector is shown in **Chapter 3**.

**Step 4:** **Connect backlight connector.** Connect the backlight connector to the driver TFT LCD PCB as shown in **Figure 4-12**. When inserting the cable connector, make sure the pins are properly aligned.



**Figure 4-12: Backlight Inverter Connection**

#### 4.6.4 PCIe Mini Card Installation

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

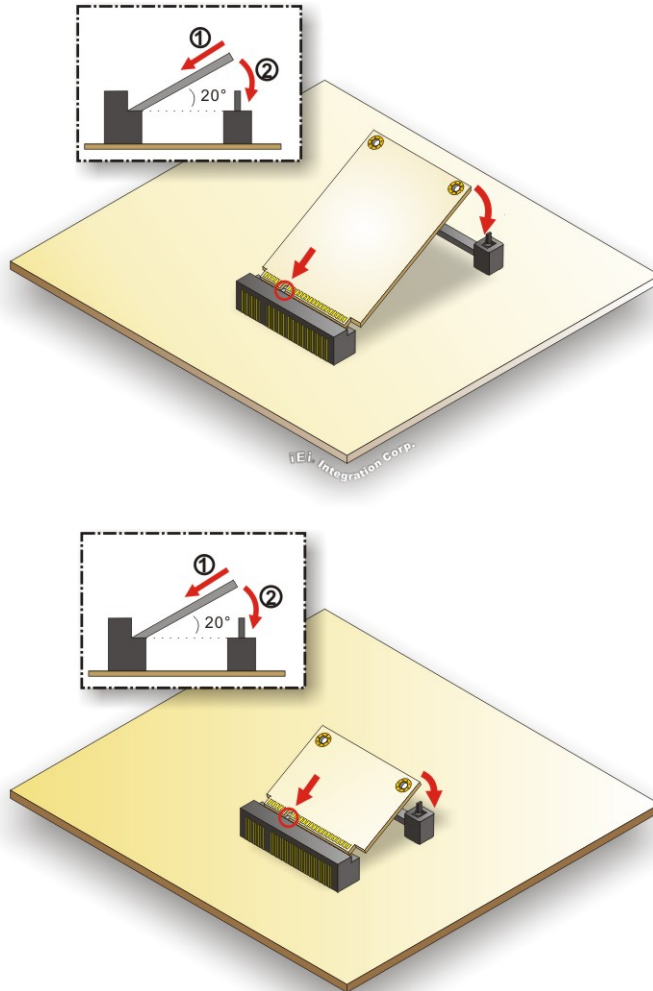


Figure 4-13: PCIe Mini Card Installation

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

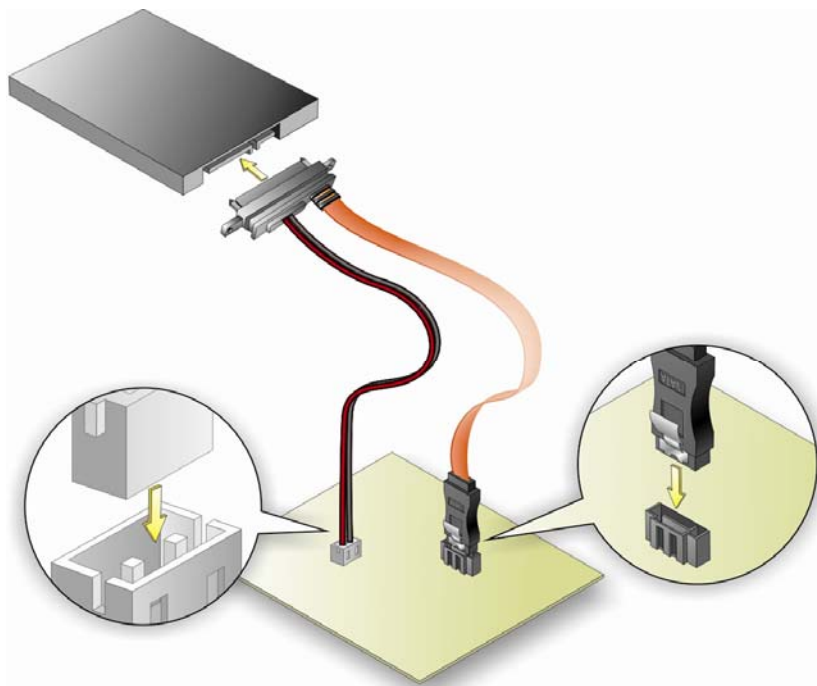
## NANO-CV-D25502/N26002 EPIC SBC

### 4.6.5 SATA Drive Connection

The NANO-CV-D25502/N26002 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 4-14**.



**Figure 4-14: SATA Drive Cable Connection**

**Step 3:** Connect the cable to the SATA disk. Connect the connector on the other end of the cable to the connector at the back of the SATA drive. See **Figure 4-14**.

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

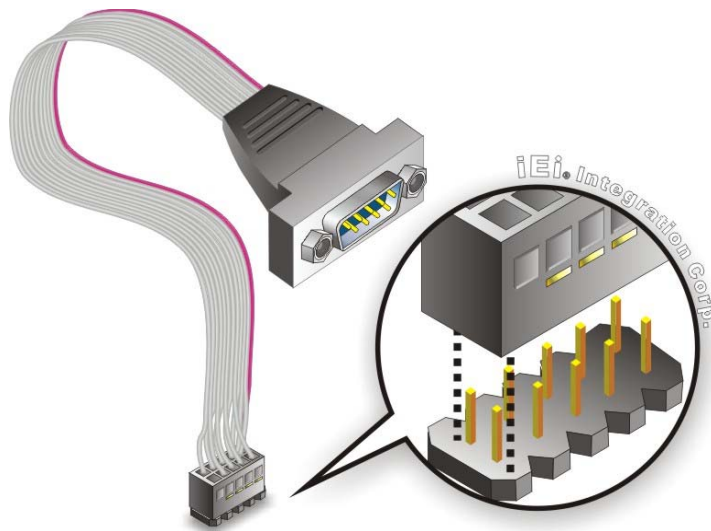


#### 4.6.6 Single RS-232 Cable

The single RS-232 cable consists of one serial port connector attached to a serial communications cable that is then attached to a D-sub 9 male connector. To install the single RS-232 cable, please follow the steps below.

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

**Step 2: Insert the cable connector.** Insert the connector into the serial port header. See **Figure 4-15**. A key on the front of the cable connector ensures the connector can only be installed in one direction.



**Figure 4-15: Single RS-232 Cable Installation**

**Step 3: Secure the bracket.** The single RS-232 connector has two retention screws that must be secured to a chassis or bracket.

**Step 4: Connect the serial device.** Once the single RS-232 connector is connected to a chassis or bracket, a serial communications device can be connected to the system.



Chapter

5

# BIOS

---

## 5.1 Introduction

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



### NOTE:

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

---

### 5.1.1 Starting Setup

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

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

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

### 5.1.2 Using Setup

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

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

**Table 5-1: BIOS Navigation Keys**

### 5.1.3 Getting Help

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

### 5.1.4 Unable to Reboot after Configuration Changes

If the computer cannot boot after changes to the system configuration is made, CMOS defaults. Use the jumper described in Chapter 4.

### 5.1.5 BIOS Menu Bar

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

- Main – Changes the basic system configuration.
- Advanced – Changes the advanced system settings.
- Chipset – Changes the chipset settings.
- Boot – Changes the system boot configuration.
- Security – Sets User and Supervisor Passwords.

- Save & Exit – Selects exit options and loads default settings.

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

## 5.2 Main

The **Main** BIOS menu (**BIOS Menu 1**) appears when the **BIOS Setup** program is entered. The **Main** menu gives an overview of the basic system information.

Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.					
Main	Advanced	Chipset	Boot	Security	Save & Exit
BIOS Information					Set the Date. Use Tab to switch between Data elements.
BIOS Vendor			American Megatrends		
Core Version			4.6.5.3 0.16		
Compliance			UEFI 2.3; PI 1.2		
Project Version			B239AR10.ROM		
Build Date and Time			05/11/2012 11:53:40		-----
System Date			[Mon 07/16/2012]		→←: Select Screen
System Time			[15:10:27]		↑ ↓: Select Item
Access Level			Administrator		Enter: Select
					+/-: Change Opt.
					F1: General Help
					F2: Previous Values
					F3: Optimized Defaults
					F4: Save & Exit
					ESC: Exit
Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.					

### BIOS Menu 1: Main

#### → System Overview

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

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

The System Overview field also has two user configurable fields:

## NANO-CV-D25502/N26002 EPIC SBC

### → 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) 2011 American Megatrends, Inc.
Main   Advanced  Chipset  Boot   Security  Save & Exit
-----
> ACPI Settings                System ACPI Parameters
> RTC Wake Settings
> CPU Configuration
> IDE Configuration
> USB Configuration
> F81866 Super IO Configuration
> F81866 H/W Monitor
> Serial Port Console Redirection
> iEi Feature

-----
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1:  General Help
F2:  Previous Values
F3:  Optimized Defaults
F4:  Save & Exit
ESC: Exit

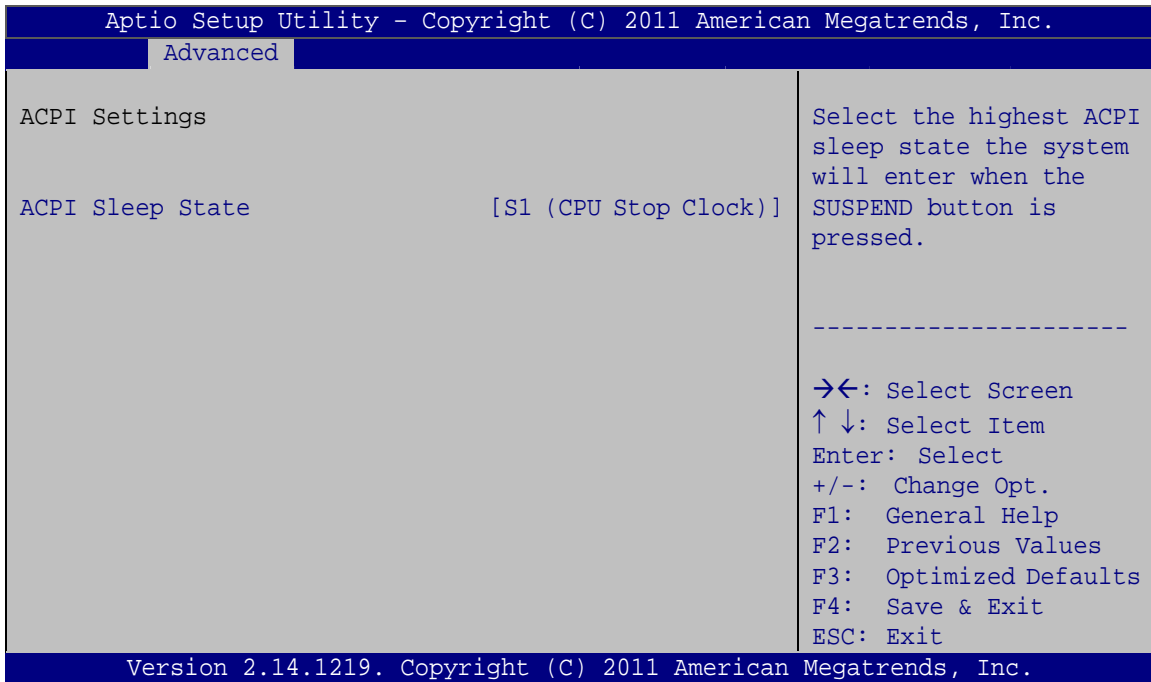
Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.
    
```

### BIOS Menu 2: Advanced



### 5.3.1 ACPI Settings

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



#### BIOS Menu 3: ACPI Settings

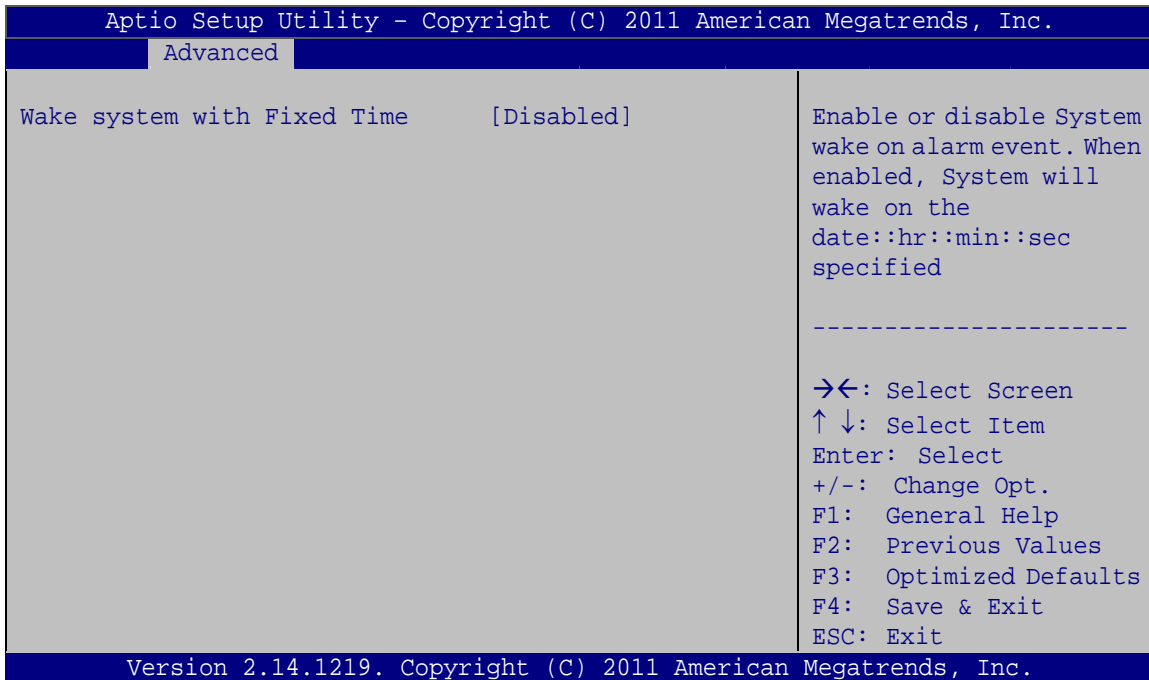
##### → ACPI Sleep State [S1 (CPU Stop Clock)]

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

- **S1 (CPU Stop Clock)** **DEFAULT** The system enters S1 (POS) sleep state. The system appears off. The CPU is stopped; RAM is refreshed; the system is running in a low power mode.
- **S3 (Suspend to RAM)** The caches are flushed and the CPU is powered off. Power to the RAM is maintained. The computer returns slower to a working state, but more power is saved.

### 5.3.2 RTC Wake Settings

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



#### BIOS Menu 4: 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.

### 5.3.3 CPU Configuration

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

```

Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
  Advanced
CPU Configuration
Processor Type           Intel(R) Atom(TM)
                        CPU D2550 @ 1.86GHz
EMT64                   Supported
Processor Speed         1865 MHz
System Bus Speed        533 MHz
Ratio Status            14
Actual Ratio            14
System Bus Speed        533 MHz
Processor Stepping      30661
Microcode Revision      269
L1 Cache RAM            2x56 k
L2 Cache RAM            2x512 k
Processor Core          Dual
Hyper-Threading         Supported

Hyper-Threading         [Enabled]

Enabled for Windows XP
and Linux (OS optimized
for Hyper-Threading
Technology) and Disabled
for other OS (OS not
optimized for
Hyper-Threading
Technology).

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

Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.
  
```

#### BIOS Menu 5: CPU Configuration

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

- **Processor Type:** Lists the brand name of the CPU being used.
- **EMT64:** Indicates if EMT64 is supported by the CPU.
- **Processor Speed:** Lists the CPU processing speed.
- **System Bus Speed:** Lists the system bus speed.
- **Ratio Status:** Lists the ratio status.
- **Actual Ratio:** Lists the ratio of the frequency to the clock speed.
- **Processor Stepping:** Lists the CPU ID.

## NANO-CV-D25502/N26002 EPIC SBC

- **Microcode Revision:** Lists the microcode revision.
- **L1 Cache RAM:** Lists the CPU L1 cache size.
- **L2 Cache RAM:** Lists the CPU L2 cache size.
- **Processor Core:** Lists the number of the processor core.
- **Hyper-Threading:** Indicates if Intel HT Technology is supported by the CPU.

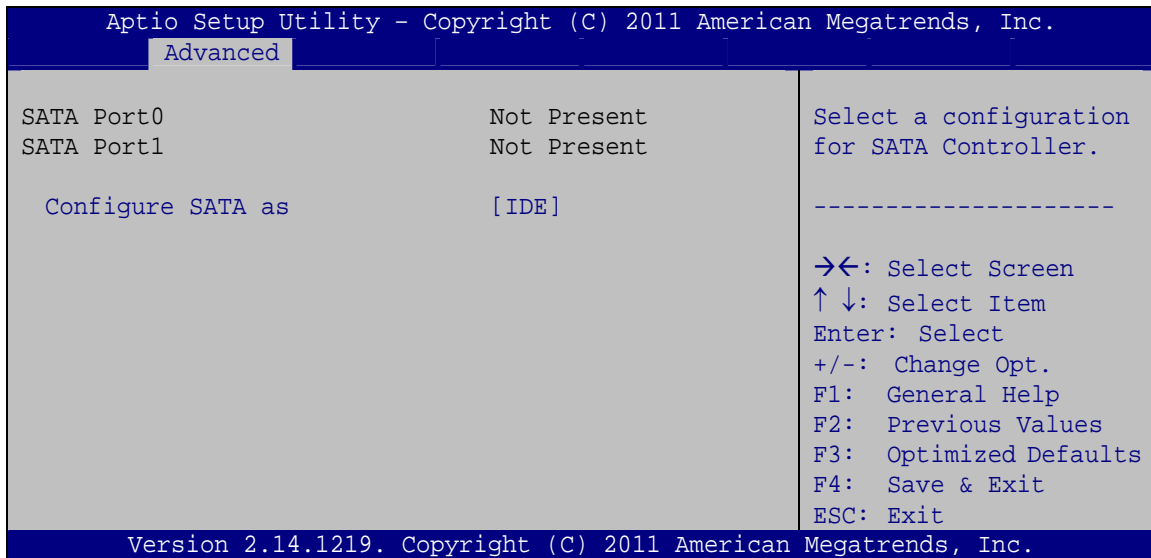
### → Hyper-Threading [Enabled]

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

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

### 5.3.4 IDE Configuration

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



#### BIOS Menu 6: IDE Configuration

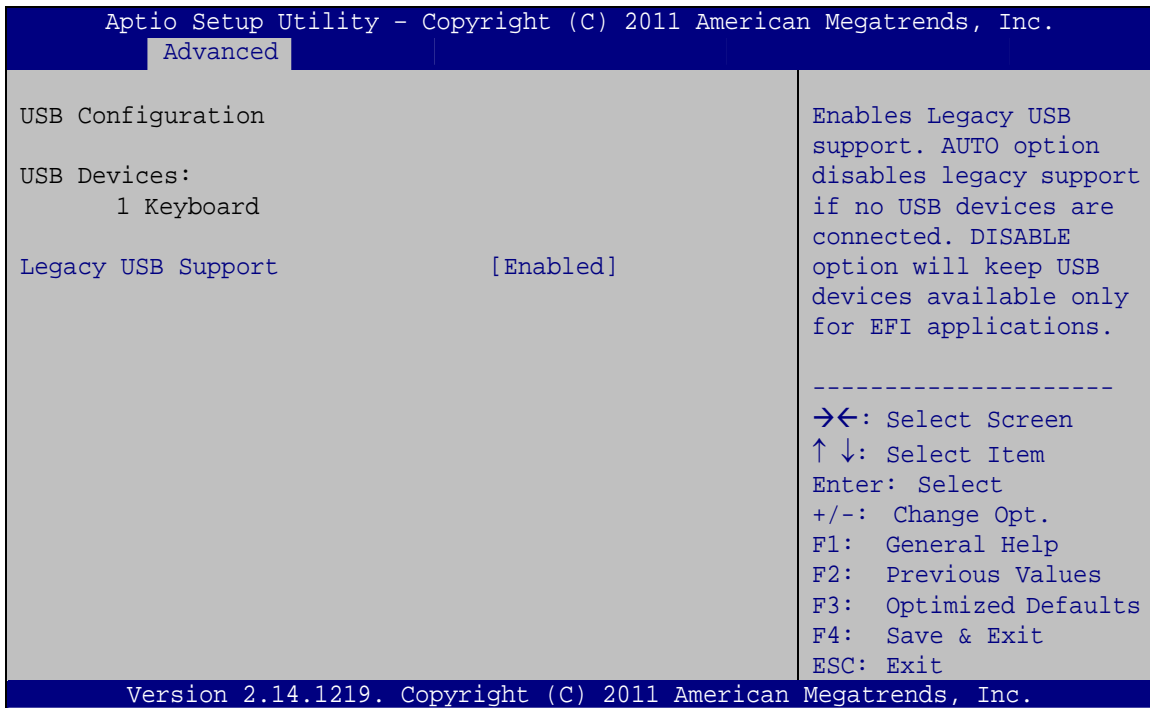
### → Configure SATA as [IDE]

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

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

### 5.3.5 USB Configuration

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



#### BIOS Menu 7: USB Configuration

##### ➔ **USB Devices**

The **USB Devices** 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



## NANO-CV-D25502/N26002 EPIC SBC

drivers loaded. When this option is enabled, any attached USB mouse or USB keyboard can control the system even when there is no USB driver loaded onto the system.

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

### 5.3.6 F81866 Super IO Configuration

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

```

Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
  Advanced
F81866 Super IO Configuration
F81866 Super IO Chip          F81866
> Serial Port 1 Configuration
> Serial Port 2 Configuration
> Serial Port 3 Configuration
> Serial Port 4 Configuration

Set Parameters of Serial
Port 1 (COMA)

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

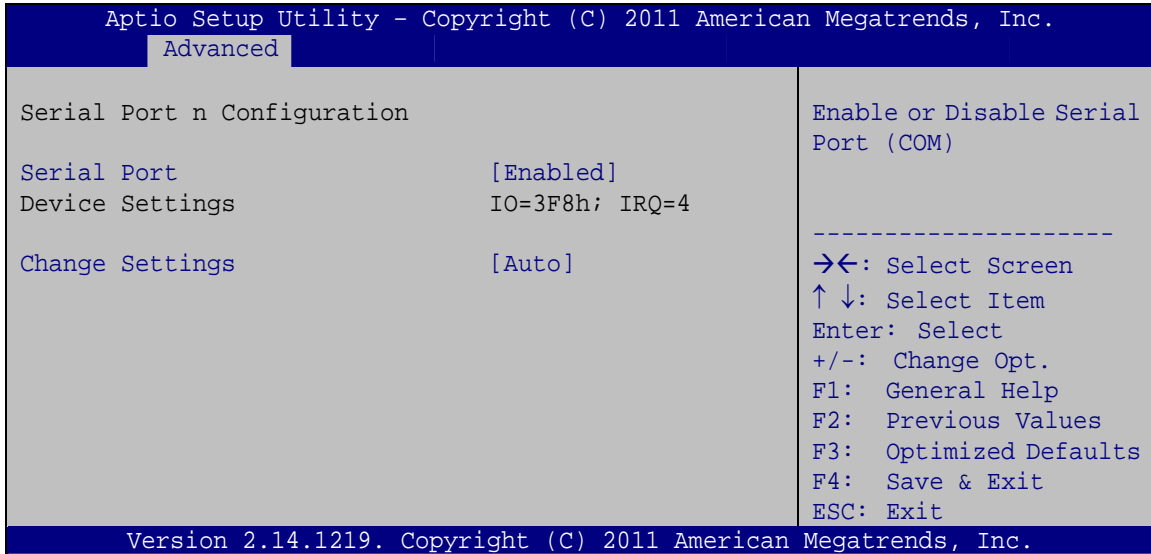
Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.

```

**BIOS Menu 8: Super IO Configuration**

### 5.3.6.1 Serial Port n Configuration

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



#### BIOS Menu 9: Serial Port n Configuration Menu

##### 5.3.6.1.1 Serial Port 1 Configuration

###### → Serial Port [Enabled]

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

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

###### → Change Settings [Auto]

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

- **Auto**                      **DEFAULT**      The serial port IO port address and interrupt address are automatically detected.
- **IO=3F8h;**  
**IRQ=4**                      Serial Port I/O port address is 3F8h and the interrupt address is IRQ4
- **IO=3F8h;**  
**IRQ=3, 4**                      Serial Port I/O port address is 3F8h and the interrupt address is IRQ3, 4

## NANO-CV-D25502/N26002 EPIC SBC

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

### 5.3.6.1.2 Serial Port 2 Configuration

#### ➔ Serial Port [Enabled]

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

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

#### ➔ Change Settings [Auto]

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

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

### 5.3.6.1.3 Serial Port 3 Configuration

→ **Serial Port [Enabled]**

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

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

→ **Change Settings [Auto]**

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

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

## NANO-CV-D25502/N26002 EPIC SBC

### 5.3.6.1.4 Serial Port 4 Configuration

#### → Serial Port [Enabled]

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

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

#### → Change Settings [Auto]

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

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



### 5.3.7 F81866 H/W Monitor

The **F81866 H/W Monitor** menu (**BIOS Menu 10**) contains the fan configuration submenus and displays operating temperature, fan speeds and system voltages.

```

Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
Advanced
PC Health Status
> Smart Fan Mode Configuration
System Temperature      : +49 C
CPU_FAN1 Speed         : N/A
SYS_FAN1 Speed         : N/A
+VCC_CPU               : +1.200 V
+VCC_GFX               : +1.680 V
+V1.05S                : +1.056 V
+V1.5_DDR3             : +1.520 V
VSB5V                  : +4.968 V
+V3.3S                 : +3.360 V
VSB3V                  : +3.392 V
VBAT                   : +3.264 V
Smart Fan Mode Select
-----
-><: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.
    
```

#### BIOS Menu 10: F81866 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 Speeds:
  - CPU Fan Speed
  - System Fan Speed
- Voltages:
  - +VCC\_CPU
  - +VCC\_GFX
  - +V1.05S
  - +1.5\_DDR3
  - VSB5V
  - +V3.3S

## NANO-CV-D25502/N26002 EPIC SBC

- VSB3V
- VBAT

### 5.3.7.1 Smart Fan Mode Configuration

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

```

Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
-----
Advanced
-----
Smart Fan Mode Configuration
CPU_FAN1 Smart Fan Control      [Auto Duty-Cycle Mode]
CPU Temperature 1                60
CPU Temperature 2                50
CPU Temperature 3                40
CPU Temperature 4                30
SYS_FAN1 Smart Fan Control      [Auto Duty-Cycle Mode]
System Temperature 1             60
System Temperature 2             50
System Temperature 3             40
System Temperature 4             30

Smart Fan Mode Select
-----
-><: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit

Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.

```

#### BIOS Menu 11: Smart Fan Mode Configuration

##### → CPU\_FAN1/SYS\_FAN1 Smart Fan Control [Auto Duty-Cycle Mode]

Use the **CPU\_FAN1** or **SYS\_FAN1 Smart Fan Control** option to configure the CPU or System Smart Fan.

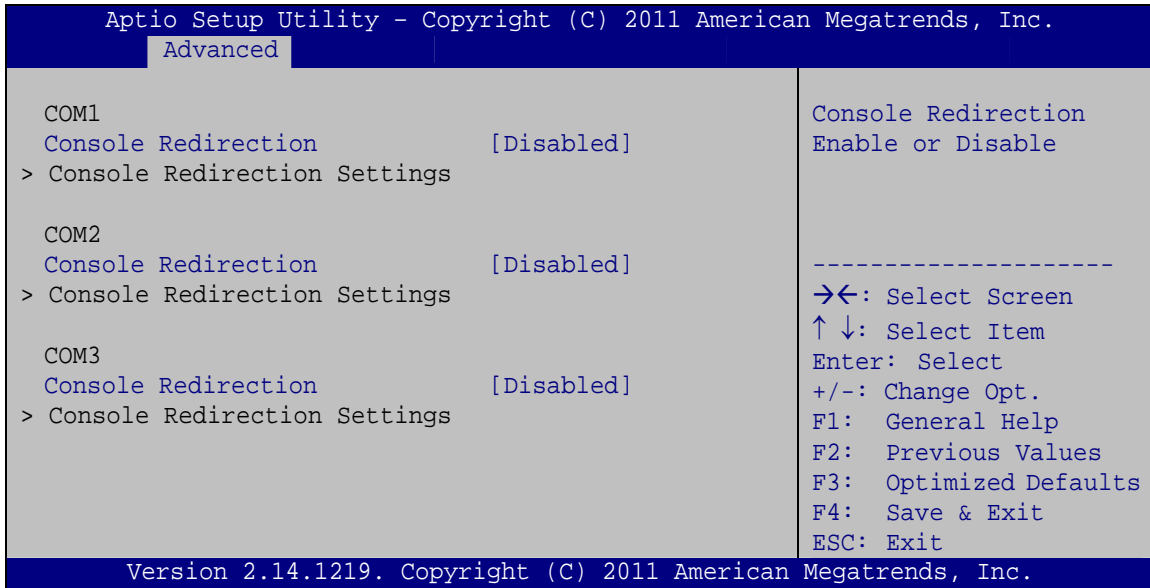
- **Auto Duty-Cycle Mode**      **DEFAULT**      The fan adjusts its speed using Auto Duty-Cycle settings
- **Manual Duty Mode**              The fan spins at the speed set in Manual Duty Mode settings

##### → CPU/System Temperature n

Use the + or – key to change the fan **CPU** or **System Temperature n** value. Enter a decimal number between 1 and 100.

### 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.



#### 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

##### → Terminal Type [ANSI]

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

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

**NANO-CV-D25502/N26002 EPIC SBC****→ Bits per second [115200]**

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

- 9600** Sets the serial port transmission speed at 9600.
- 19200** Sets the serial port transmission speed at 19200.
- 38400** Sets the serial port transmission speed at 38400.
- 57600** Sets the serial port transmission speed at 57600.
- 115200** **DEFAULT** Sets the serial port transmission speed at 115200.

**→ Data Bits [8]**

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

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

**→ Parity [None]**

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

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

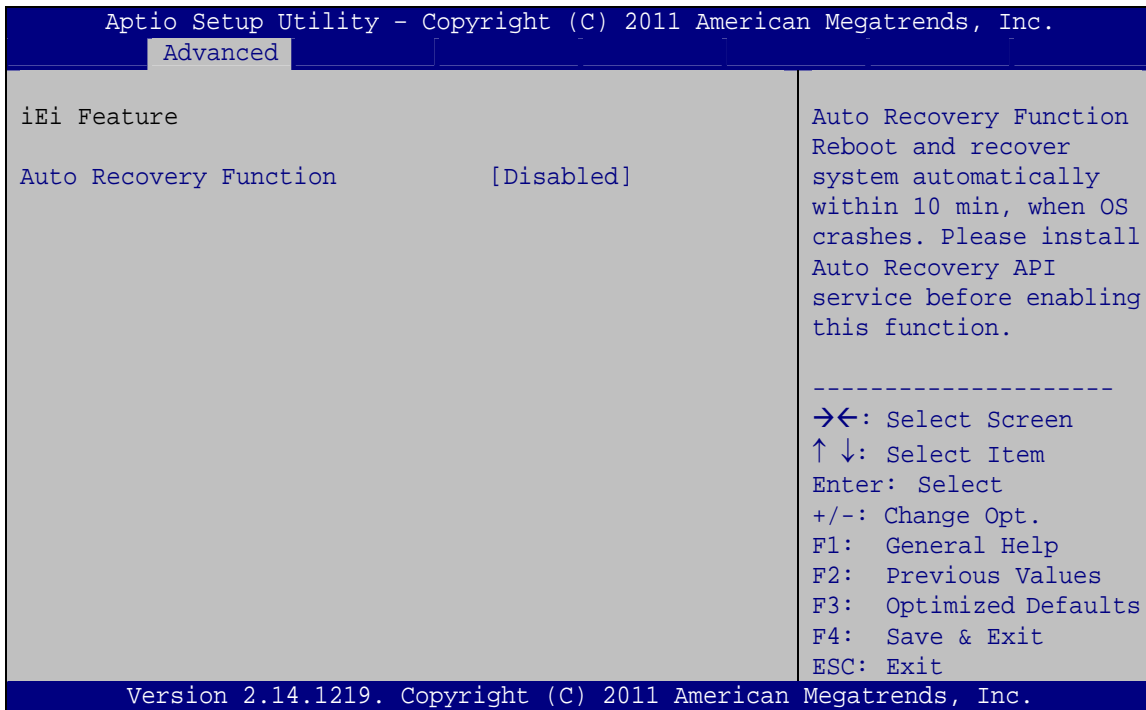
➔ **Stop Bits [1]**

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

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

**5.3.9 iEi Feature**

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



**BIOS Menu 13: iEi Feature**

➔ **Auto Recovery Function [Disabled]**

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

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



## NANO-CV-D25502/N26002 EPIC SBC

### 5.4 Chipset

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



#### **WARNING!**

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

```
Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
Main   Advanced  Chipset  Boot   Security  Save & Exit
-----
> Host Bridge
> South Bridge

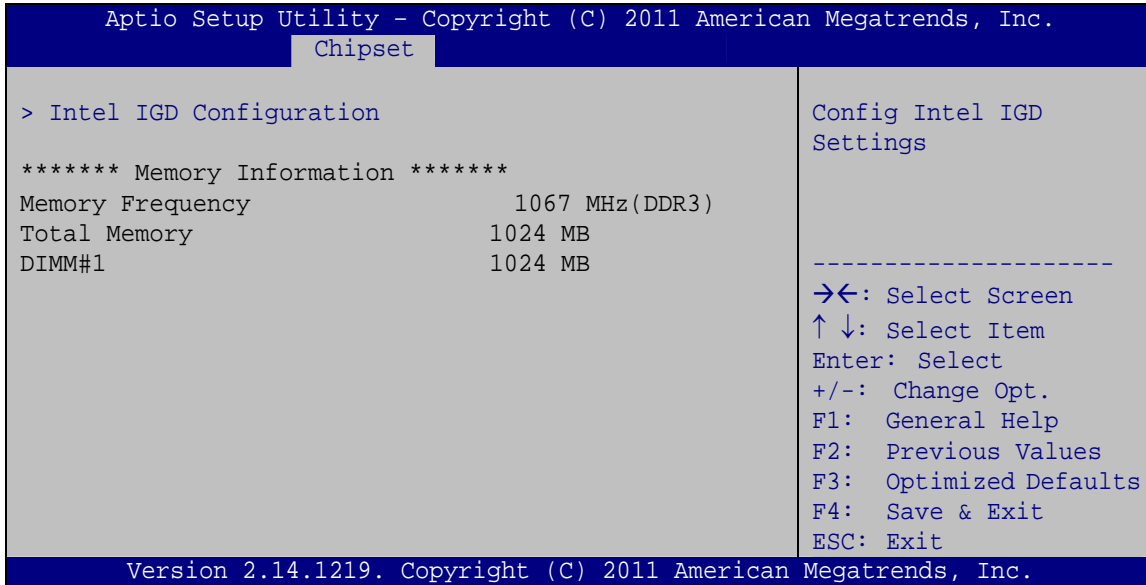
Host Bridge Parameters
-----
-><: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit

Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.
```

**BIOS Menu 14: Chipset**

#### 5.4.1 Host Bridge Configuration

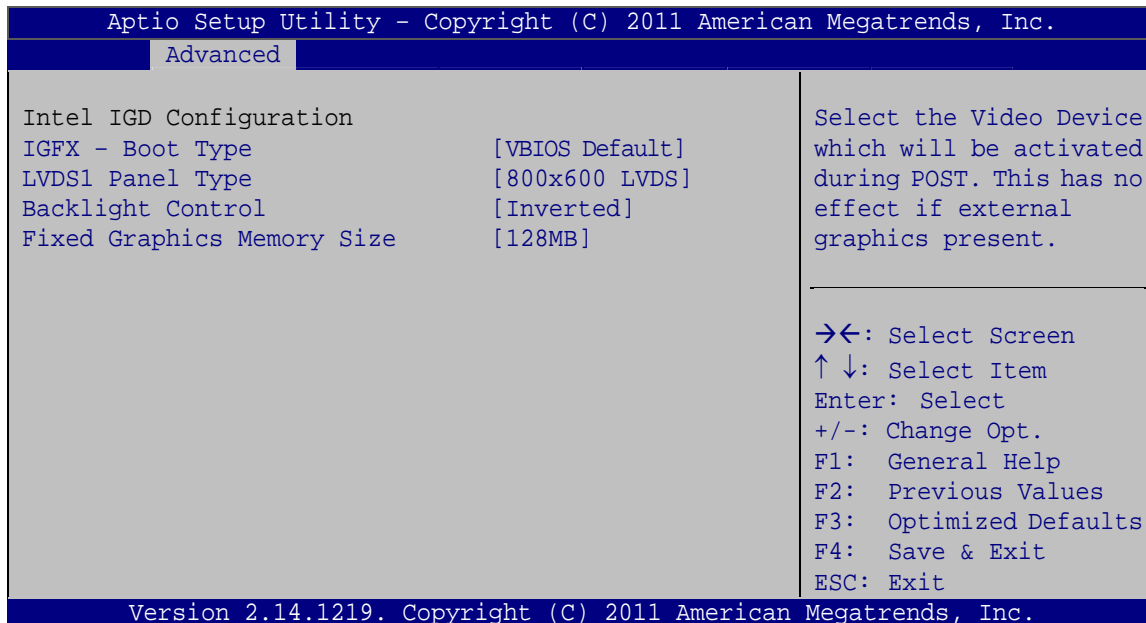
Use the **Host Bridge Configuration** menu (**BIOS Menu 15**) to configure the Intel IGD Configuration and display the memory information.



**BIOS Menu 15: Host Bridge Configuration**

**5.4.1.1 Intel IGD Configuration**

Use the **Intel IGD Configuration** submenu (**BIOS Menu 16**) to configure the video device connected to the system.



**BIOS Menu 16: Intel IGD Configuration**

## NANO-CV-D25502/N26002 EPIC SBC

### → IGFX - Boot Type [VBIOS Default]

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

- VBIOS Default    **DEFAULT**
- CRT1
- CRT2
- LVDS1

### → LVDS1 Panel Type [800x600 LVDS]

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

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

### → Backlight Control [Inverted]

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

- **Normal**                      Brightest at high voltage level
- **Inverted**    **DEFAULT**      Brightest at low voltage level

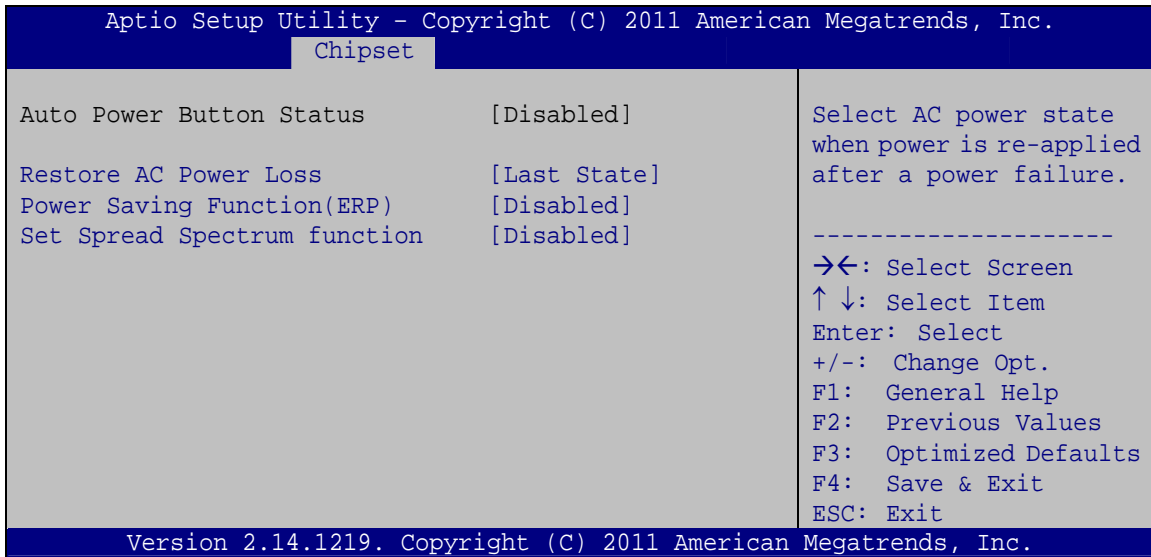
### → Fixed Graphics Memory Size [128MB]

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

- 128MB            **DEFAULT**
- 256MB

### 5.4.2 South Bridge Configuration

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



#### BIOS Menu 17: South Bridge Configuration

##### → Restore AC Power Loss [Last State]

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

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

##### → Power Saving Function(ERP) [Disabled]

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

- **Disabled    DEFAULT**            Disables the power saving function.
- **Enabled**                            Enables the power saving function.

## NANO-CV-D25502/N26002 EPIC SBC

### → Set Spread Spectrum Function [Disabled]

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

- **Disabled**      **DEFAULT**      The spread spectrum mode is disabled
- **Enabled**                      The spread spectrum mode is enabled

## 5.5 Boot

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

```

Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
Main   Advanced   Chipset   Boot   Security   Save & Exit
-----
Boot Configuration
Bootup NumLock State           [On]
Quiet Boot                      [Enabled]
Launch PXE OpROM               [Disabled]
Option ROM Messages           [Force BIOS]
UEFI Boot                      [Disabled]

Boot Option Priorities

-----
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1:  General Help
F2:  Previous Values
F3:  Optimized Defaults
F4:  Save & Exit
ESC: Exit

Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.

```

### BIOS Menu 18: Boot

### → Bootup NumLock State [On]

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

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



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

### → **Quiet Boot [Enabled]**

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

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

### → **Launch PXE OpROM [Disabled]**

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

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

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

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

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

### → **UEFI Boot [Disabled]**

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

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



```
Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
Main   Advanced  Chipset  Boot   Security  Save & Exit
-----
Save Changes and Reset
Discard Changes and Reset

Restore Defaults
Save as User Defaults
Restore User Defaults

Reset the system after
saving the changes.

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

Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.
```

### BIOS Menu 20: Save & Exit

#### → Save Changes and Reset

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

#### → Discard Changes and Reset

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

#### → Restore Defaults

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

#### → Save as User Defaults

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

#### → Restore User Defaults

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

Chapter

**6**

# Software Drivers

---

## 6.1 Available Software Drivers

---



### NOTE:

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

---

The following drivers can be installed on the system:

- Chipset
- VGA
- LAN
- Audio

Installation instructions are given below.

## 6.2 Starting the Driver Program

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

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

---



### NOTE:

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

---

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



# NANO-CV-D25502/N26002 EPIC SBC

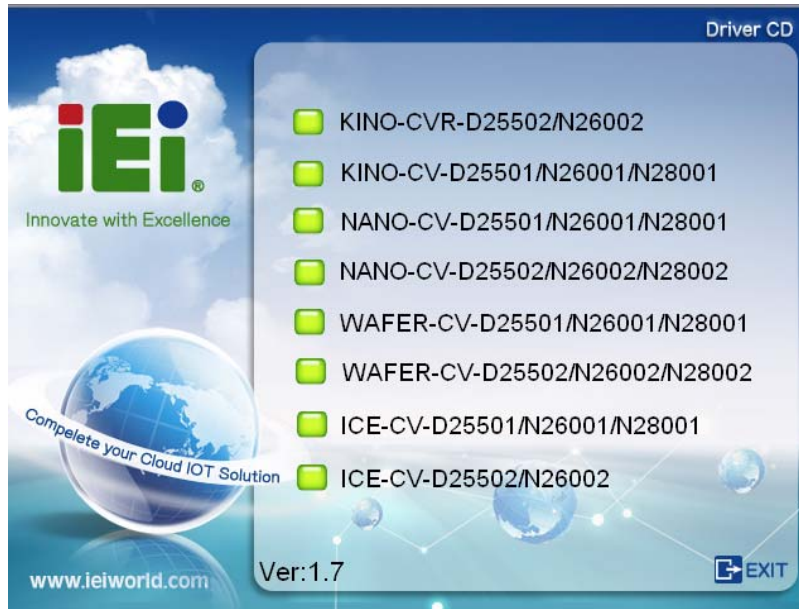


Figure 6-1: Start Up Screen

**Step 3:** Click NANO-CV-D25502/N26002.

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

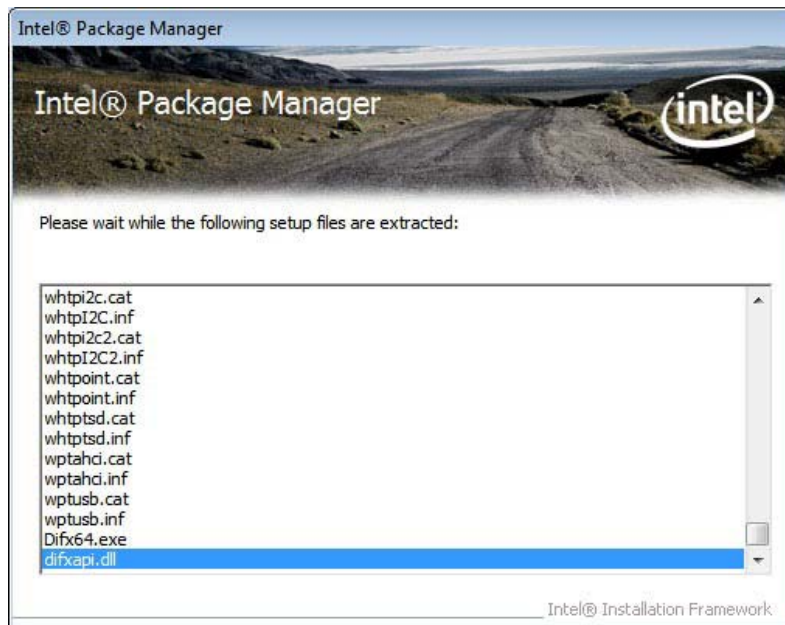


Figure 6-2: Drivers

## 6.3 Chipset Driver Installation

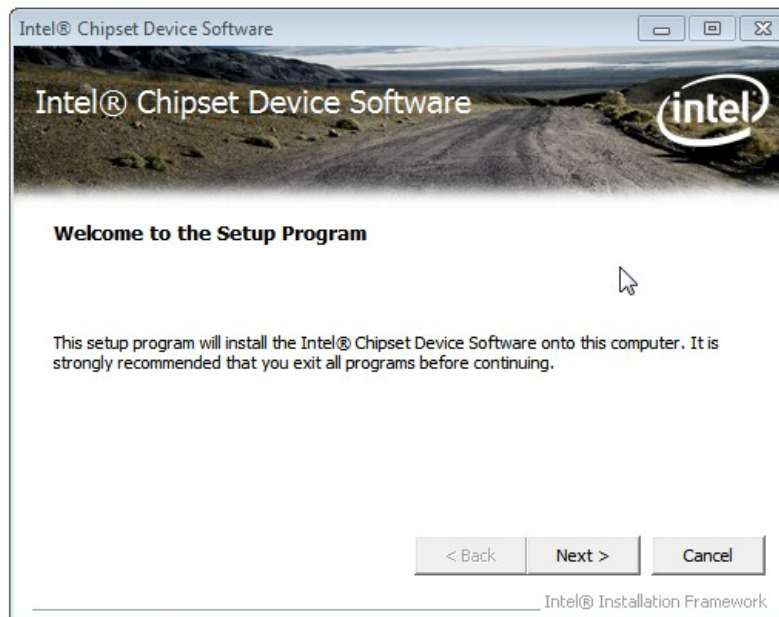
To install the chipset driver, please do the following.

- Step 1:** Access the driver list. (See **Section 6.2**)
- Step 2:** Click “1-Chipset”.
- Step 3:** Go to the 32-bit or 64-bit folder that corresponds to your OS version.
- Step 4:** Open the **Intel Chipset Software Installation Utility** folder.
- Step 5:** Double click the **infinst\_autol** icon.
- Step 6:** The setup files are extracted as shown in **Figure 6-3**.



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

- Step 7:** When the setup files are completely extracted, the **Welcome Screen** in **Figure 6-4** appears.



**Figure 6-4: Chipset Driver Welcome Screen**

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

**Step 9:** The license agreement in **Figure 6-5** appears.

**Step 10:** Read the **License Agreement**.

**Step 11:** Click **Yes** to continue.

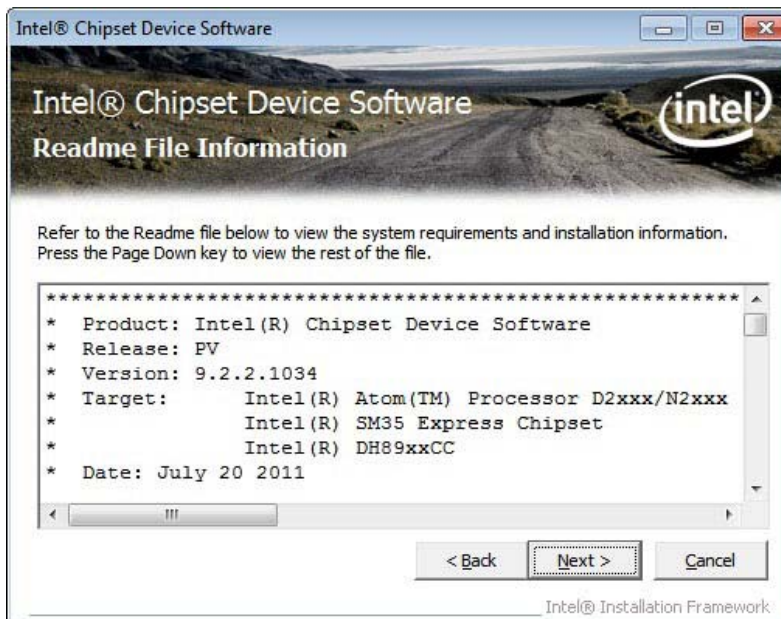




**Figure 6-5: Chipset Driver License Agreement**

**Step 12:** The Read Me file in **Figure 6-6** appears.

**Step 13:** Click **Next** to continue.



**Figure 6-6: Chipset Driver Read Me File**

**Step 14:** Setup Operations are performed as shown in **Figure 6-7**.



**Figure 6-7: Chipset Driver Setup Operations**

**Step 15:** Once the **Setup Operations** are complete, click **Next** to continue.

**Step 16:** The **Finish** screen appears.

**Step 17:** Select “**Yes, I want to restart the computer now**” and click the **Finish** icon.

See **Figure 6-8**.



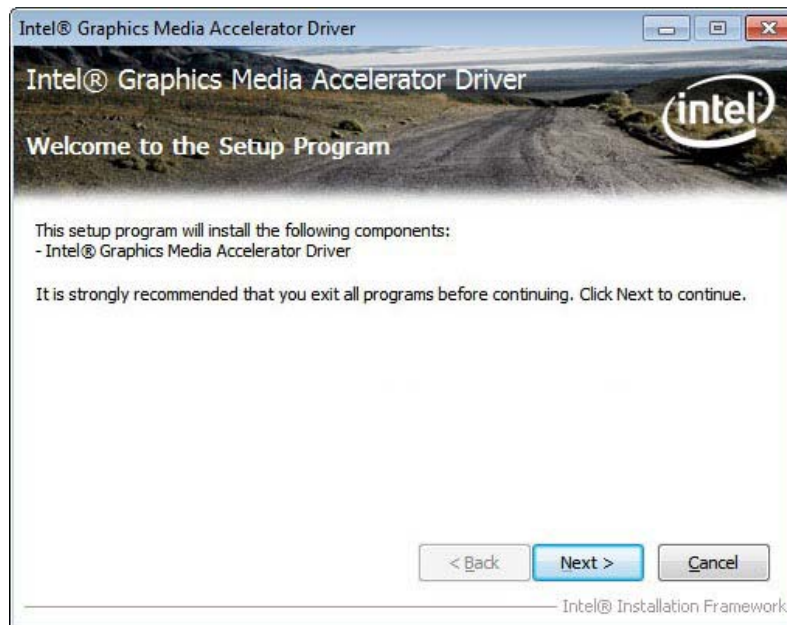


Figure 6-8: Chipset Driver Installation Finish Screen

## 6.4 VGA Driver Installation

To install the VGA driver, please do the following.

- Step 1:** Access the driver list. (See **Section 6.2**)
- Step 2:** Click "**2-Graphics**".
- Step 3:** Open the 32-bit or 64-bit folder that corresponds to your OS version.
- Step 4:** Double click the **Setup** icon.
- Step 5:** The **Welcome Screen** in **Figure 6-9** appears.



**Figure 6-9: VGA Driver Welcome Screen**

- Step 6:** Click **Next** to continue.
- Step 7:** The license agreement in **Figure 6-10** appears.
- Step 8:** Read the **License Agreement**.
- Step 9:** Click **Yes** to continue.

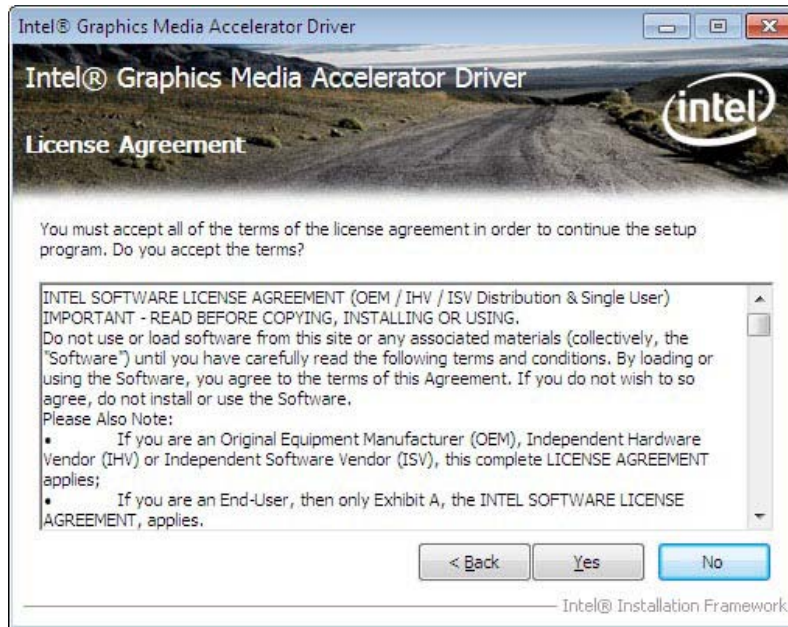


Figure 6-10: VGA Driver License Agreement

**Step 10:** The Read Me file in Figure 6-11 appears.

**Step 11:** Click **Next** to continue.

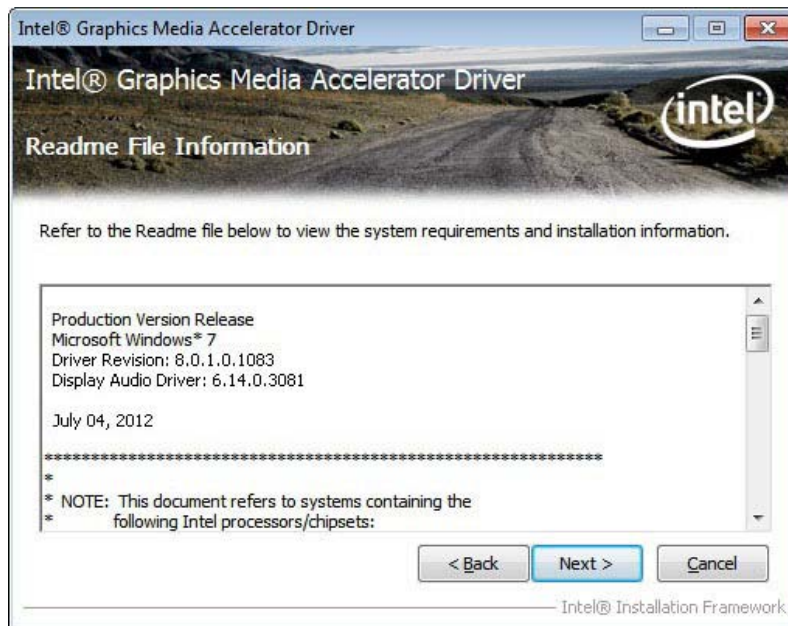
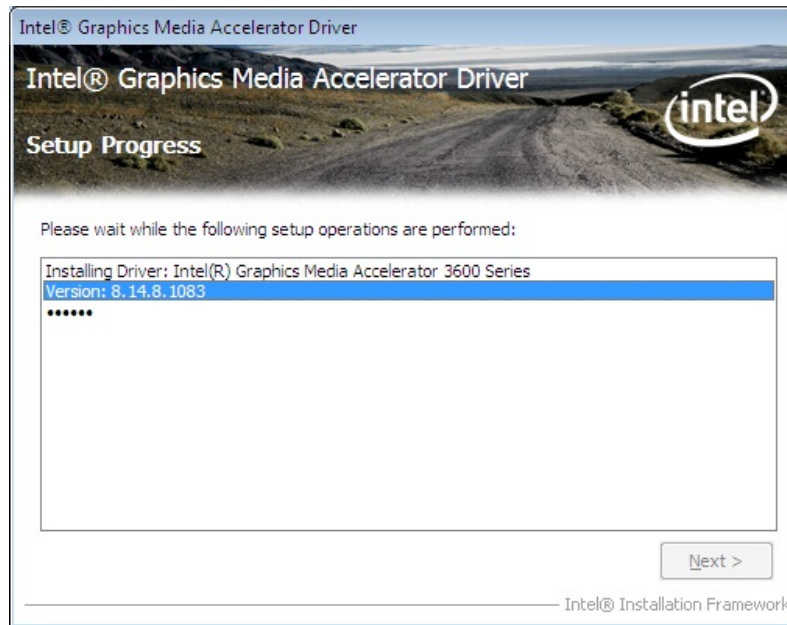


Figure 6-11: VGA Driver Read Me File



**Step 12:** Setup Operations are performed as shown in Figure 6-12.



**Figure 6-12:** VGA Driver Setup Operations

**Step 13:** Once the Setup Operations are complete, click the Next icon to continue.

**Step 14:** The Finish screen appears.

**Step 15:** Select "Yes, I want to restart the computer now" and click the Finish icon.

See Figure 6-13.

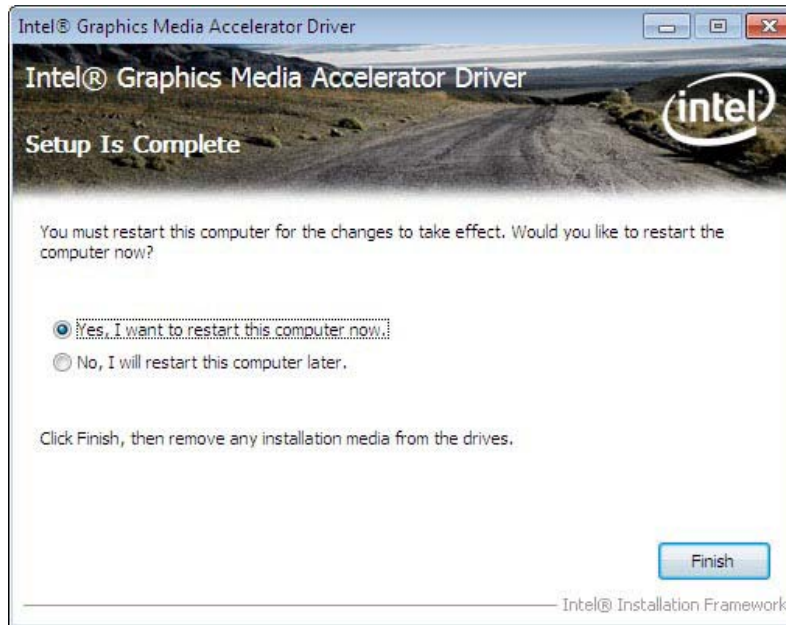


Figure 6-13: VGA Driver Installation Finish Screen

## 6.5 LAN Driver Installation

To install the LAN driver, please do the following.

- Step 1:** Access the driver list shown in **Figure 6-2**. (See **Section 6.2**)
- Step 2:** Click “**3-LAN**”.
- Step 3:** Go to the **Realtek > Install\_Win7\_7048\_09162011** folder.
- Step 4:** Double click the **setup** icon.
- Step 5:** The **Welcome** screen in **Figure 6-14** appears.



## NANO-CV-D25502/N26002 EPIC SBC

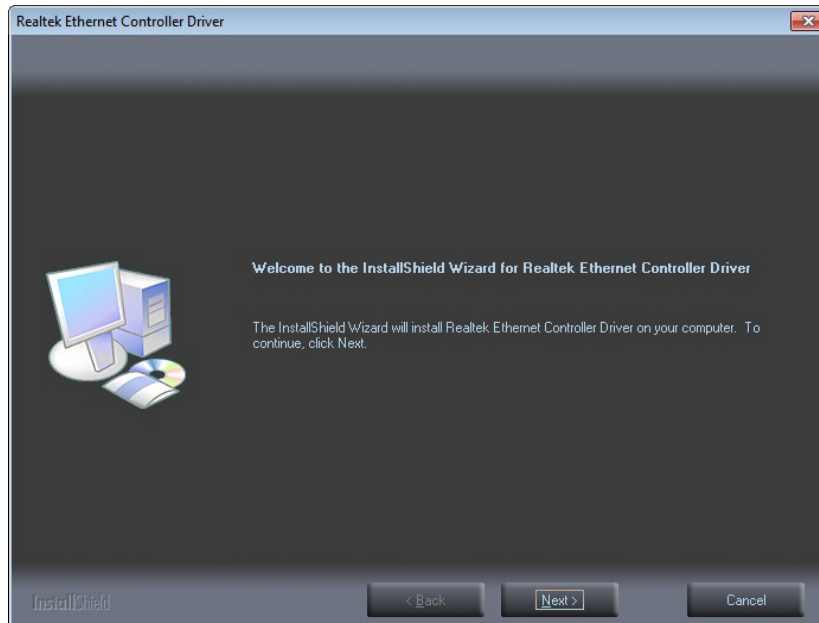


Figure 6-14: LAN Driver Welcome Screen

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

**Step 7:** The **Ready to Install** screen in **Figure 6-15** appears.

**Step 8:** Click **Install** to proceed with the installation.

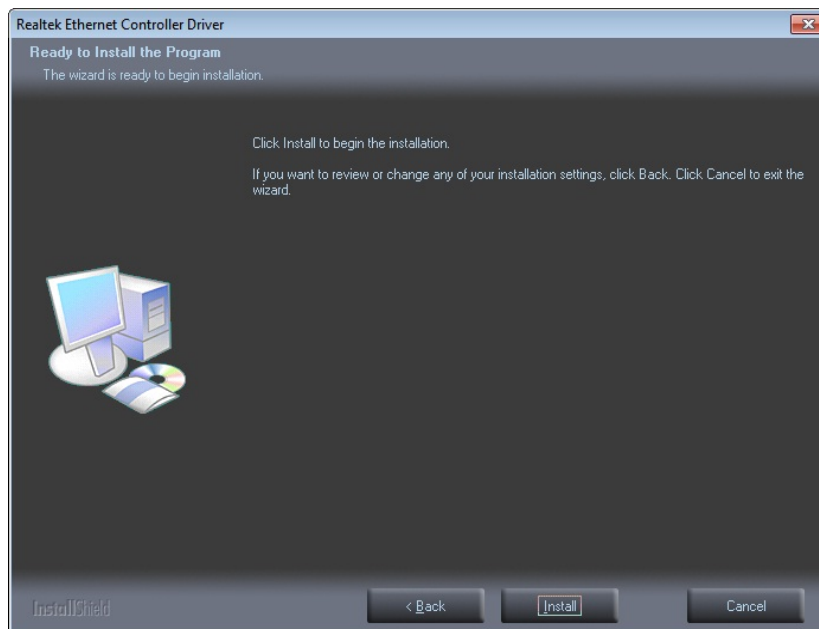
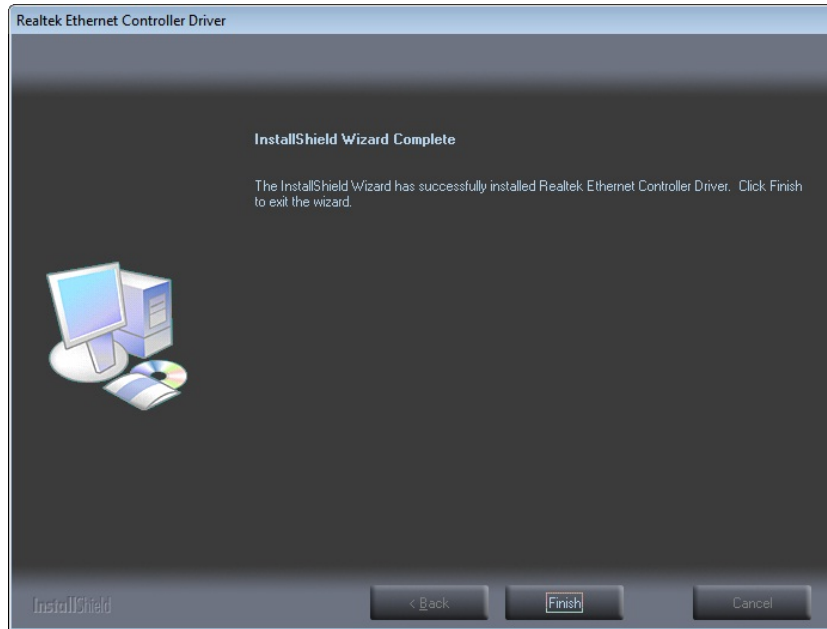


Figure 6-15: LAN Driver Installation

**Step 9:** The program begins to install.

**Step 10:** When the driver installation is complete, the screen in **Figure 6-16** appears.

**Step 11:** Click **Finish** to exit.



**Figure 6-16: LAN Driver Installation Complete**

## 6.6 Audio Driver Installation

To install the Audio driver, please do the following.

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

**Step 2:** Click "**4-Audio**".

**Step 3:** Open the **Win7** folder.

**Step 4:** Double click the **Vista\_Win7\_R263** icon.

**Step 5:** The installation files are extracted as shown in **Figure 6-17**.

## NANO-CV-D25502/N26002 EPIC SBC

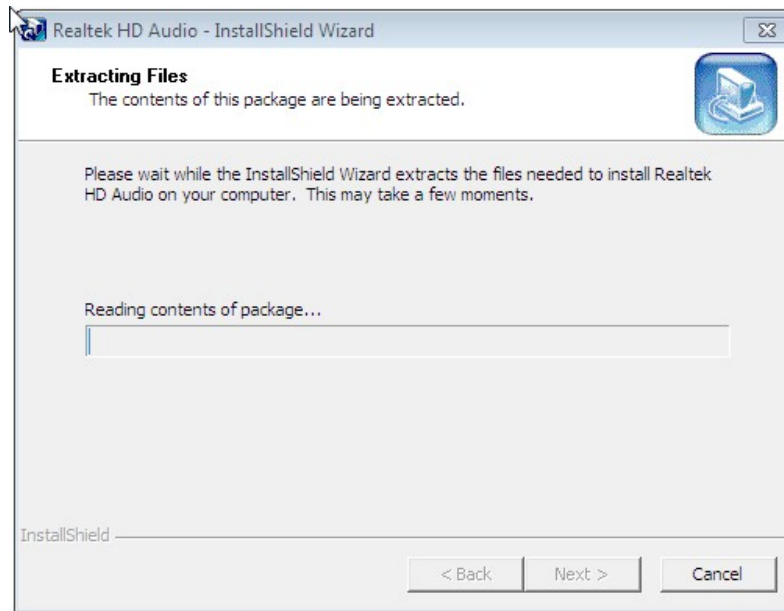


Figure 6-17: Audio Driver Installation File Extraction

**Step 6:** The **Welcome** screen in **Figure 6-18** appears.

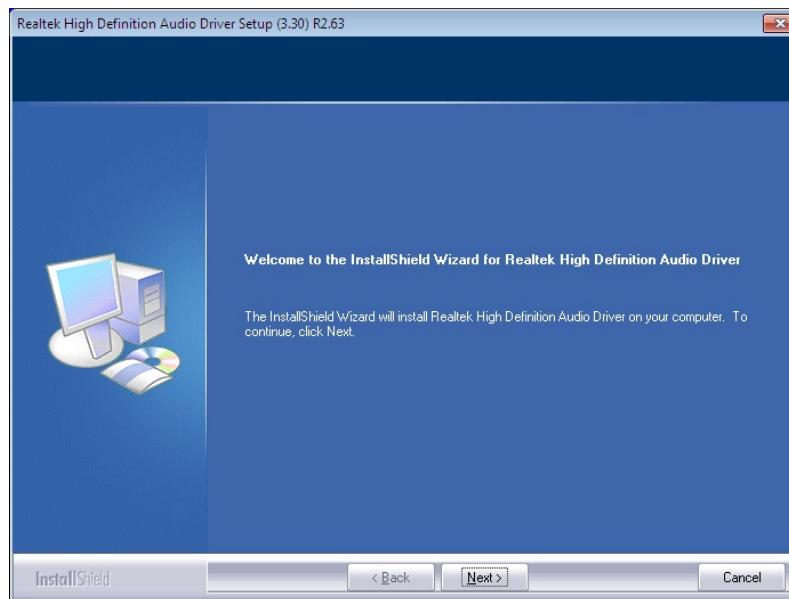
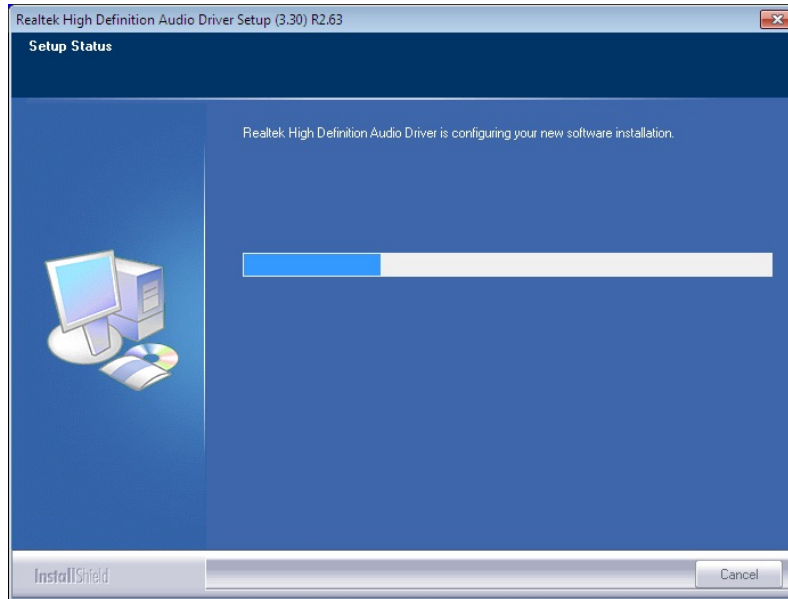


Figure 6-18: Audio Driver Welcome Screen

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

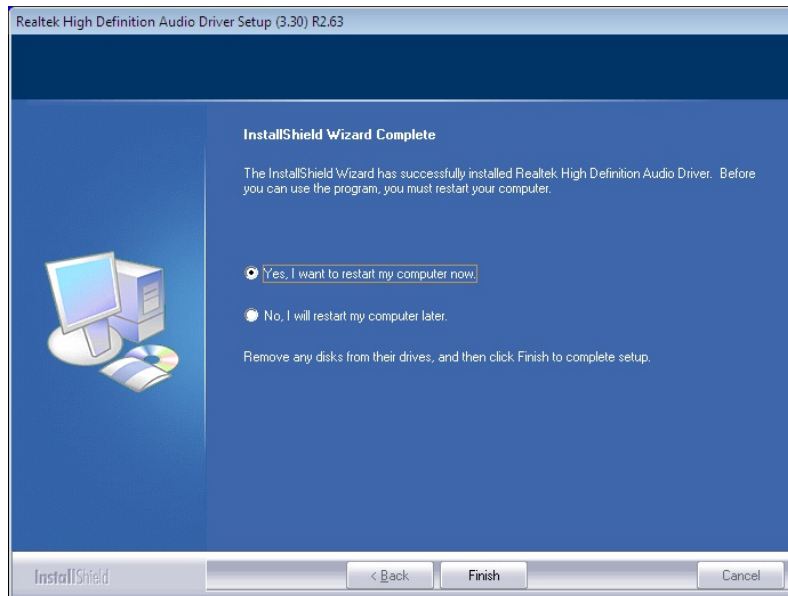
**Step 8:** The program begins to install.

**Step 9:** The installation progress can be monitored in the progress bar shown in **Figure 6-19**.



**Figure 6-19: Audio Driver Installation**

**Step 10:** When the driver installation is complete, the screen in **Figure 6-20** appears.



**Figure 6-20: Audio Driver Installation Complete**

## NANO-CV-D25502/N26002 EPIC SBC

**Step 11:** Select “**Yes, I want to restart my computer now**” and click **Finish**.

**Step 12:** The system reboots.



Appendix

**A**

# Regulatory Compliance

---

## **DECLARATION OF CONFORMITY**



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

## **FCC WARNING**



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

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

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

Appendix

**B**

# BIOS Options

---

## NANO-CV-D25502/N26002 EPIC SBC

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

<b>System Overview</b> .....	<b>54</b>
<b>System Date [xx/xx/xx]</b> .....	<b>55</b>
<b>System Time [xx:xx:xx]</b> .....	<b>55</b>
<b>ACPI Sleep State [S1 (CPU Stop Clock)]</b> .....	<b>56</b>
<b>Wake system with Fixed Time [Disabled]</b> .....	<b>57</b>
<b>Hyper-Threading [Enabled]</b> .....	<b>59</b>
<b>Configure SATA as [IDE]</b> .....	<b>59</b>
<b>USB Devices</b> .....	<b>60</b>
<b>Legacy USB Support [Enabled]</b> .....	<b>60</b>
<b>Serial Port [Enabled]</b> .....	<b>62</b>
<b>Change Settings [Auto]</b> .....	<b>62</b>
<b>Serial Port [Enabled]</b> .....	<b>63</b>
<b>Change Settings [Auto]</b> .....	<b>63</b>
<b>Serial Port [Enabled]</b> .....	<b>64</b>
<b>Change Settings [Auto]</b> .....	<b>64</b>
<b>Serial Port [Enabled]</b> .....	<b>65</b>
<b>Change Settings [Auto]</b> .....	<b>65</b>
<b>PC Health Status</b> .....	<b>66</b>
<b>CPU_FAN1/SYS_FAN1 Smart Fan Control [Auto Duty-Cycle Mode]</b> .....	<b>67</b>
<b>CPU/System Temperature n</b> .....	<b>67</b>
<b>Console Redirection [Disabled]</b> .....	<b>68</b>
<b>Terminal Type [ANSI]</b> .....	<b>68</b>
<b>Bits per second [115200]</b> .....	<b>69</b>
<b>Data Bits [8]</b> .....	<b>69</b>
<b>Parity [None]</b> .....	<b>69</b>
<b>Stop Bits [1]</b> .....	<b>70</b>
<b>Auto Recovery Function [Disabled]</b> .....	<b>70</b>
<b>IGFX - Boot Type [VBIOS Default]</b> .....	<b>73</b>
<b>LVDS1 Panel Type [800x600 LVDS]</b> .....	<b>73</b>
<b>Backlight Control [Inverted]</b> .....	<b>73</b>
<b>Fixed Graphics Memory Size [128MB]</b> .....	<b>73</b>
<b>Restore AC Power Loss [Last State]</b> .....	<b>74</b>
<b>Power Saving Function(ERP) [Disabled]</b> .....	<b>74</b>

<b>Set Spread Spectrum Function [Disabled].....</b>	<b>75</b>
<b>Bootup NumLock State [On].....</b>	<b>75</b>
<b>Quiet Boot [Enabled] .....</b>	<b>76</b>
<b>Launch PXE OpROM [Disabled] .....</b>	<b>76</b>
<b>Option ROM Messages [Force BIOS].....</b>	<b>76</b>
<b>UEFI Boot [Disabled] .....</b>	<b>76</b>
<b>Administrator Password .....</b>	<b>77</b>
<b>User Password .....</b>	<b>77</b>
<b>Save Changes and Reset .....</b>	<b>78</b>
<b>Discard Changes and Reset .....</b>	<b>78</b>
<b>Restore Defaults .....</b>	<b>78</b>
<b>Save as User Defaults .....</b>	<b>78</b>
<b>Restore User Defaults .....</b>	<b>78</b>



Appendix

C

# Terminology

---

<b>AC '97</b>	Audio Codec 97 (AC'97) refers to a codec standard developed by Intel® in 1997.
<b>ACPI</b>	Advanced Configuration and Power Interface (ACPI) is an OS-directed configuration, power management, and thermal management interface.
<b>AHCI</b>	Advanced Host Controller Interface (AHCI) is a SATA Host controller register-level interface.
<b>ATA</b>	The Advanced Technology Attachment (ATA) interface connects storage devices including hard disks and CD-ROM drives to a computer.
<b>ARMD</b>	An ATAPI Removable Media Device (ARMD) is any ATAPI device that supports removable media, besides CD and DVD drives.
<b>ASKIR</b>	Amplitude Shift Keyed Infrared (ASKIR) is a form of modulation that represents a digital signal by varying the amplitude (“volume”) of the signal. A low amplitude signal represents a binary 0, while a high amplitude signal represents a binary 1.
<b>BIOS</b>	The Basic Input/Output System (BIOS) is firmware that is first run when the computer is turned on and can be configured by the end user
<b>CODEC</b>	The Compressor-Decompressor (CODEC) encodes and decodes digital audio data on the system.
<b>CMOS</b>	Complimentary metal-oxide-conductor is an integrated circuit used in chips like static RAM and microprocessors.
<b>COM</b>	COM refers to serial ports. Serial ports offer serial communication to expansion devices. The serial port on a personal computer is usually a male DB-9 connector.
<b>DAC</b>	The Digital-to-Analog Converter (DAC) converts digital signals to analog signals.
<b>DDR</b>	Double Data Rate refers to a data bus transferring data on both the rising and falling edges of the clock signal.
<b>DMA</b>	Direct Memory Access (DMA) enables some peripheral devices to bypass the system processor and communicate directly with the system memory.

## NANO-CV-D25502/N26002 EPIC SBC

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

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

Appendix

**D**

# Digital I/O Interface

---



## D.1 Introduction

The DIO connector on the NANO-CV-D25502/N26002 is interfaced to GPIO ports on the Super I/O chipset. The DIO has both 4-bit digital inputs and 4-bit digital outputs. The digital inputs and digital outputs are generally control signals that control the on/off circuit of external devices or TTL devices. Data can be read or written to the selected address to enable the DIO functions.



**NOTE:**

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

---

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

**INT 15H:**

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

## NANO-CV-D25502/N26002 EPIC SBC

## D.2 Assembly Language Sample 1

```

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

```

AL low byte = value

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

## D.3 Assembly Language Sample 2

```

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

```

Digital Output is 1001b

Appendix

**E**

# Watchdog Timer

---



**NOTE:**

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

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

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

INT 15H:

<b>AH – 6FH Sub-function:</b>	
AL – 2:	Sets the Watchdog Timer’s period.
BL:	Time-out value (Its unit-second is dependent on the item “Watchdog Timer unit select” in CMOS setup).

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

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

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

**NOTE:**

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

**EXAMPLE PROGRAM:**

```
; INITIAL TIMER PERIOD COUNTER
```

```
;
```

```
W_LOOP:
```

```
;
```

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

```
;
```

```
; ADD THE APPLICATION PROGRAM HERE
```

```
;
```

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

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

```
;
```

```
; EXIT ;
```



Appendix

**F**

# Hazardous Materials Disclosure

---

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

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

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

Please refer to the table on the next page.

**NANO-CV-D25502/N26002 EPIC SBC**

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

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

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

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

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

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

○: 表示该有毒有害物质在该部件所有物质材料中的含量均在 SJ/T11363-2006 标准规定的限量要求以下。  
 X: 表示该有毒有害物质至少在该部件的某一均质材料中的含量超出 SJ/T11363-2006 标准规定的限量要求。