# UNO-2053

GX1-300 Universal Network Controller with PC Card, 2 x LAN, 2 x USB, 2 x RS-232

**User's Manual**

## Acknowledgements



Part No. 2003205300

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## Product warranty

Advantech warrants to you, the original purchaser, that each of its products will be free from defects in materials and workmanship for one year from the date of purchase.

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1. Collect all the information about the problem encountered. (For example, CPU speed, Advantech products used, other hardware and software used, etc.) Note anything abnormal and list any on-screen messages you get when the problem occurs.
2. Call your dealer and describe the problem. Please have your manual, product, and any helpful information readily available.
3. If your product is diagnosed as defective, obtain an RMA (return merchandize authorization) number from your dealer. This allows us to process your return more quickly.
4. Carefully pack the defective product, a fully completed Repair and Replacement Order Card and a photocopy proof of purchase date (such as your sales receipt) in a shippable container. A product returned without proof of the purchase date is not eligible for warranty service.
5. Write the RMA number visibly on the outside of the package and ship it prepaid to your dealer.

## Technical support and sales assistance

If you have any technical questions about the UNO-2053 or any other Advantech products, please visit our support website at:

**http://www.advantech.com/support**

For more information about Advantech's products and sales information, please visit:

**http://www.advantech.com**

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CHAPTER 1

# UNO-2053 Overview

This chapter gives background information on the UNO-2053. It shows you the UNO-2053 overview and specifications.

Sections include:

- Introduction
- Hardware Specifications
- Safety Precautions
- UNO-2053 Series
- Chassis Dimension

## 1.1 Introduction

Are you looking forward to a suitable embedded Application Ready Platform (ARP) that could shorten your development time and offer rich networking interfaces to fulfill your extensive needs in different kind of projects? Advantech Universal Network Controller (UNO-2000 series) is your ANSWER concentrating the services on Network-enabled Application Ready Platform total solution.

Leveraging field-approved and worldwide-awareness real-time OS technology, Advantech UNO-2000 series provides Windows CE .NET ready solution and support several standard networking interfaces, such as Ethernet, Wireless LAN, RS-232/422/485 and so on. Because of its openness, great expansion capability and reliable design – fanless and diskless, Advantech UNO-2000 series becomes an ideal embedded platform to implement custom applications in diversified applications.

## 1.2 Hardware Specifications

**CPU:** NS Geode GX1-300 MHz

**Chipset:** NS CS5530A

**BIOS:** AWARD 256 KB FLASH BIOS

**RAM:** 64 MB SDRAM on board

**VGA:** Supports VGA and VESA

- Display memory: 1 ~ 4 MB share memory, set in BIOS
- CRT display mode: Non-interlaced CRT monitors resolutions up to 1280 x 1024 @ 256 colors or 1024 x 768 @ 16 bpp
- DB-15 VGA connector

**Serial Port:** Two standard RS-232 ports

- IRQ: All ports use the same IRQ assigned by BIOS
- Data bits: 5, 6, 7, 8

- Stop bits: 1, 1.5, 2
- Parity: none, even, odd
- Speed: 50~230.4Kbps
- Data signals: TxD, RxD, RTS, CTS, DTR, DSR, DCD, RI, GND
- Max data distance: 50 feet (15.2 meters)

**USB interface:** Two USB ports, USB OpenHCI, Rev. 1.0 compliant

**Ethernet Port:** Dual 10/100Base-T Ethernet

- LAN chip: Realtek 8139C chipset supports
- LED on the front side

**PC Card:** One PC Card slot

- Support CardBus (Card-32) Card and 16-bit (PCMCIA 2.1/JEIDA4.2) Card
- Support +5V, +3.3V and +12V@120mA working power

**SSD:** One Type I / Type II CompactFlash TM card slot inside the chassis

**LED:** One power LED, one IDE LED

**Keyboard/Mouse connector:** Mini-DIN connector supports PS/2 keyboard and a PS/2 mouse

**Power supply voltage:** 10-30 V DC , reversed wiring protection

**Power Consumption:** 10 W max under +24V power input

**Power Requirement:** 8.4 W typical under +24 V power input

**Operating temperature:** 0 ~ 55°F (0 ~ 131°F)

**Chassis size:** 164.8 mm (W) x 106.5 mm (L) x 35.5 mm (H) (6.5" x 4.2" x 1.4")

**Weight:** 0.8 kg

## 1.3 Safety Precautions

The following sections tell how to make each connection. In most cases, you will simply need to connect a standard cable. All of the connector pin assignments are shown in Appendix A.

***Warning!*** *Always disconnect the power cord from your chassis whenever you are working on it. Do not connect while the power is on. A sudden rush of power can damage sensitive electronic components. Only experienced electronics personnel should open the chassis.*

***Caution!*** *Always ground yourself to remove any static electric charge before touching UNO-2053. Modern electronic devices are very sensitive to static electric charges. Use a grounding wrist strap at all times. Place all electronic components on a static-dissipative surface or in a static-shielded bag..*

## 1.4 UNO-2053 Series

There are two products in UNO-2053 series listed as below:

- **UNO-2053:** UNO-2053 hardware platform
- **UNO-2053CE:** UNO-2053 hardware platform with Windows CE .NET (built in 32MB CompactFlash™ card)

**Packing list**

Before installing your board, make sure that the following materials have been received:

**Common parts:**

- Warranty certificate
- Software Supporting CD-ROM
- 6P-6P-6P 20cm KB and PS/2 Mouse Y cable (P/N: 1652002202)
- Phoenix power connector (P/N 1652002202)
- DIN-rail mounting accessory (1997001110, 1997001120, 1997001130, 1997001140)

**For UNO-2053CE only:**

- Built in 32MB CompactFlash™ card with Microsoft Windows CE .NET
- End User License Agreement for Windows CE .NET

If any of these items are missing or damaged, contact your distributor or sales representative immediately.

## 1.5 Chassis Dimensions

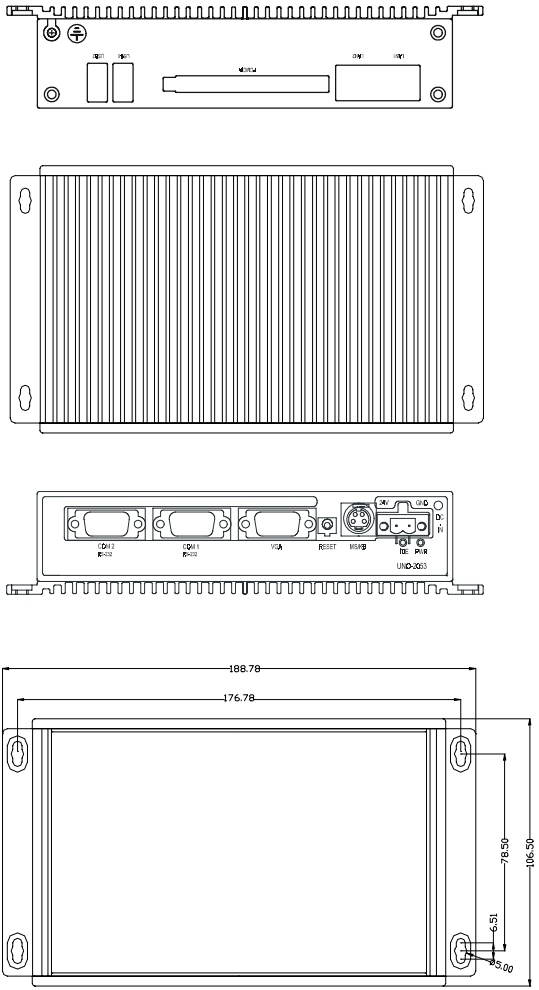



**Figure 1-1: Chassis dimensions**

CHAPTER 2

# Hardware Functionality

This chapter shows how to set up the UNO-2053's hardware functions, including connecting peripherals, switches and indicators.

Sections include:

- UNO-2053 Peripherals
- COM1~COM2: RS-232 Interfaces
- LAN: Ethernet Connector
- Power Connector
- LED Indicators
- PS/2 Keyboard and Mouse Connector
- USB1 & USB2: Universal Serial Bus connectors
- PCMCIA: PC Card Slot
- VGA: VGA Display Connector
- RESET: Reset Button

## 2.1 UNO-2053 Peripherals

The following two figures show the connectors on UNO-2053. The following sections give you detail information about function of each peripheral.

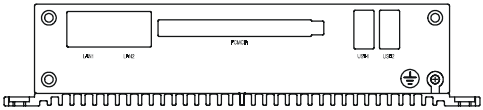


**Figure 2-1: UNO-2053 front panel**

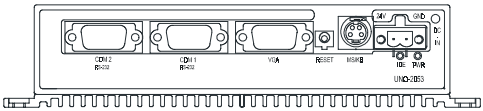



**Figure 2-2: UNO-2053 rear panel**

## 2.2 COM1~COM2: RS-232 Interfaces

The UNO-2053 offers two standard RS-232 serial communication interface ports, and they are COM1 and COM2. Please refer to A.2 for its pin assignments.

## 2.3 LAN: Ethernet Connector

The UNO-2053 is equipped with two Realtek RTL8139C Ethernet LAN controller that is fully compliant with IEEE 802.3u 10/100Base-T CSMA/CD standards. The Ethernet port provides a standard RJ-45 jack on board, and LED indicators on the front side to show its Link (Yellow LED) and Active (Green LED) status. Please refer to A.3 for its pin assignments.

## 2.4 Power Connector

The UNO-2053 comes with a Phoenix connector that carries 10~30 $V_{DC}$ external power input, and features reversed wiring protection. Therefore, it will not cause any damage to the system by reversed wiring of ground line and power line. Please refer to A.4 for its pin assignments.

## 2.5 LED Indicators

There are two LEDs on the UNO-2053 front panel for indicating system status: PWR LED is for power status and IDE LED is for IDE bus status.

## 2.6 PS/2 Keyboard and Mouse Connector

The UNO-2053 provides a PS/2 keyboard and PS/2 mouse connector. A 6-pin mini-DIN connector is located on the rear panel of the UNO-2053. The UNO-2053 comes with an adapter to convert from the 6-pin mini-DIN connector to two 6-pin mini-DIN connectors for PS/2 keyboard and PS/2 mouse connection. Please refer to Appendix A.5 for its pin assignments.

## 2.7 USB1 & USB2: Universal Serial Bus connectors

The USB connector is used for connecting any device that conforms to the USB interface. Many recent digital devices conform to this standard. The USB interface supports Plug and Play, which enables you to connect or disconnect a device whenever you want without turning off the computer.

The UNO-2053 provides two connectors of USB interfaces, which gives complete Plug & Play and hot swapping for up to 127 external devices. The USB interface complies with USB specification OpenHCI, Rev. 1.0. The USB interface can be disabled in the system BIOS setup. Please refer to Appendix A.6 for its pin assignments.

## 2.8 PCMCIA: PC Card Slot

The UNO-2053 provides one PC Card slot that supports CardBus (Card-32) Card and 16-bit (PCMCIA 2.1/JEIDA 4.2) Card standard. It supports +3.3V, +5V and +12V@120mA working voltage.

PC Card is a 85.6 mm long by 54 mm wide (3.37" x 2.126") sized, 68-pin connector used and removable module standardized by PCMCIA that is known as “PCMCIA card.”

ps. PCMCIA interrupt assignment is IRQ 9.

## 2.9 VGA: VGA Display Connector

The UNO-2053 provides a VGA controller for a high resolution VGA interface. It supports VGA and VESA, up to 1280 x 1024 @ 8 bpp and 1024 x 768 @ 16bpp resolution and up to 4 MB share memory. The VGA interface is reserved for system testing and debugging. The UNO-2053’s JP2 is a 6-pin mini connector for a VGA monitor. A VGA cable is attached to convert from a 6-pin mini connector to standard VGA connector. Pin assignments for VGA display are detailed in Appendix A.7.

## 2.10 RESET: Reset Button

Press “RESET” button will activate a reset function.

CHAPTER 3

# Initial Setup

This chapter shows how to initial the UNO-2053, sections include:

Sections include:

- Insert CompactFlash Card
- Chassis grounding
- Connect the Power
- BIOS Setup and System Assignments

## 3.1 Insert CompactFlash Card

The procedure for installing a CompactFlash™ card into the UNO-2053 is as follows, please follows these steps carefully.

**Step 1:** Remove power cord.

**Step 2:** Unscrew four screws from the rear panel of the UNO-2053.

**Step 3:** Remove the rear panel.

**Step 4:** Plug a CompactFlash™ card with user's OS and application program into a CompactFlash™ card slot on board.

**Step 5:** Screw back the rear panel with four screws.

## 3.2 Chassis Grounding

Please connect chassis ground of UNO-2053 with "EARTH" as GROUND.

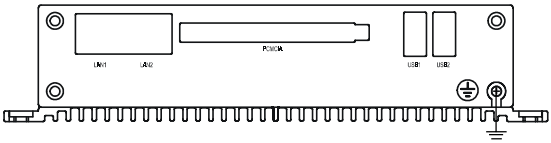
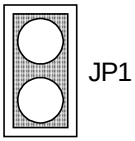


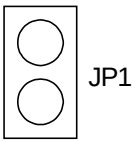
**Figure 3-1 Chassis Grounding connection**

**UNO-2053 has on-board jumper JP1 to select if connecting chassis ground with system's power ground.**

Connecting chassis ground with system power ground: (Default)




Not connecting chassis ground with system power ground:



## 3.3 Connect the Power

Connect the UNO-2053 to a 10 ~ 30 $V_{DC}$ power source. The power source can either be from a power adapter or an in-house power source.

## 3.4 BIOS Setup and System Assignments

UNO-2053 adopts Advantech SOM-2353 CPU module. For UNO-2053 BIOS setup and system assignments, you can refer to SOM-2353 Chapter 4 “Award BIOS Setup” and Appendix A “System Assignments” for detailed information. The SOM-2353 user’s manual is located under “Manual” folder on the CD-ROM.”

Please note that you can try to “LOAD BIOS DEFAULTS” from BIOS Setup manual if the UNO-2053 does not work properly.

APPENDIX A

# Pin Assignments

This appendix gives the UNO-2053 pin assignments

- Board Connectors and Jumpers
- RS-232 Serial Port
- Ethernet RJ-45 Connector
- Phoenix Power Connector
- PS/2 Keyboard and Mouse Connector
- USB Connector
- VGA Display Connector
- CompactFlash™ Master/Slave Jumper Setting
- Enhanced IDE connctor
- LCD connector (Reserved)
- Audio connector (Reserved)

# A.1 Board Connectors and Jumpers

There are connectors and jumpers on the UNO-2053 board. The following sections tell you how to configure the UNO-2053 hardware setting. Figure A-1 and figure A-2 show the locations of UNO-2053 connectors and jumpers.

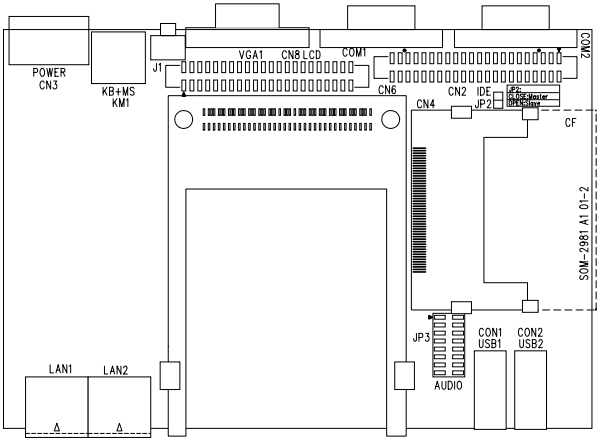



**Figure A-1: UNO-2053 connector and jumper locations (Top View)**

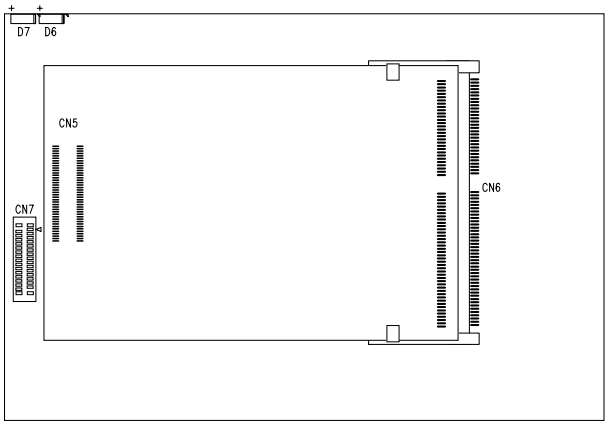
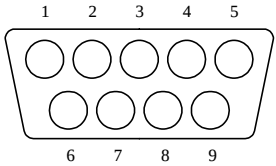



**Figure A-2: UNO-2053 connector and jumper locations (Bottom View)**

**Table A-1: UNO-2053 connectors and jumpers**

| Label | Function |
|---|---|
| CN2 | Internal IDE connector |
| CN3 | Phoenix power connector |
| CN4 | Internal CompactFlash card slot |
| CN6 | PC Card slot |
| CN7 | LCD input from SOM-2353 CN1 |
| CN8 | LCD connector (reserved) |
| COM1 | COM1 standard RS-232 serial port |
| COM2 | COM2 standard RS-232 serial port |
| CON1 | USB1 connector |
| CON2 | USB2 connector |
| D6 | IDE LED |
| D7 | Power LED |
| J1 | Reset button |
| JP1 | System grounding mode |
| JP2 | CompactFlash IDE Primary Master/Slave Jumper |
| JP3 | Audio connector (reserved) |
| KM1 | PS/2 Keyboard and Mouse connector |
| LAN1 | Ethernet 1 RJ-45 connector |
| LAN2 | Ethernet 2 RJ-45 connector |
| VGA1 | VGA DB-15 connector |

## A.2 Standard RS-232 Serial Port ~~9C~~ (COM1~~C0M2)




**Pin Assignments**

**Table A-2: RS-232 serial port pin assignments**

| Pin | RS-232 Signal Name |
|---|---|
| 1 | DCD |
| 2 | RxD |
| 3 | TxD |
| 4 | DTR |
| 5 | GND |
| 6 | DSR |
| 7 | RTS |
| 8 | CTS |
| 9 | RI |

## A.3 Ethernet RJ-45 Connector (LAN1~LAN2)

**Ethernet RJ-45 Connector Pin Assignments**

**Table A-3: Ethernet RJ-45 connector pin assignments**

| Pin | 10/100Base-T Signal Name |
|---|---|
| 1 | XMT+ |
| 2 | XMT- |
| 3 | RCV+ |
| 4 | NC |
| 5 | NC |
| 6 | RCV- |
| 7 | NC |
| 8 | NC |

## A.4 Phoenix Power Connector (CN3)

**Phoenix Power Connector Pin Assignments**

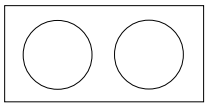



**Table A-4: Phoenix power connector pin assignments**

| Pin | Signal Name |
|---|---|
| 1 | +10~30 $V_{DC}$ |
| 2 | GND |

## A.5 PS/2 Keyboard and Mouse Connector (KM1)

**PS/2 KB/MS Connector Pin Assignments**

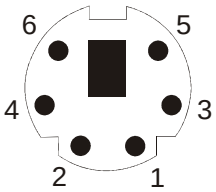



**Table A-5: Keyboard and Mouse connector pin assignments**

| Pin | Signal Name |
|---|---|
| 1 | KB DATA |
| 2 | MS DATA |
| 3 | GND |
| 4 | VCC |
| 5 | KB CLOCK |
| 6 | MS CLOCK |

## A.6 USB Connector (CON1, CON2)

**USB Connector Pin Assignments**

**Table A-6: USB connector pin assignments**

| Pin | Signal Name | Cable Color |
|---|---|---|
| 1 | VCC | Red |
| 2 | DATA- | White |
| 3 | DATA+ | Green |
| 5 | GND | Black |

## A.7 VGA Display Connector (VGA1)

**VGA Connector Pin Assignments**

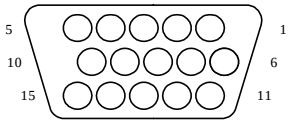



**Table A-7: VGA adaptor cable pin assignments**

| Pin | Signal Name | Pin | Signal Name |
|---|---|---|---|
| 1 | RED | 9 | NC |
| 2 | GREEN | 10 | GND |
| 3 | BLUE | 11 | NC |
| 4 | NC | 12 | NC |
| 5 | GND | 13 | H-SYNC |
| 6 | GND | 14 | V-SYNC |
| 7 | GND | 15 | NC |
| 8 | GND | | |

**Chipset**

The UNO-2053 uses a Cyrix CS5530A chipset for its SVGA controller. It supports interlaced and non-interlaced analog monitors (color and monochrome VGA) in high-resolution modes while maintaining complete IBM VGA compatibility. Digital monitors (i.e. MDA, CGA and EGA) are NOT supported. Multiple frequency (multisync) monitors are handled as if they were analog monitors.

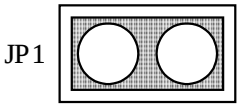
**Display memory**

With 1 ~ 4 MB share memory, the VGA controller can drive CRT displays or color panel displays with resolutions up to 1024 x 768 at 64 K colors. For 1024 x 768 color resolution, the display is expanded to 4 MB in BIOS.

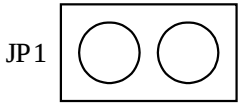
## A.8 CompactFlash™ Master/Slave Jumper Setting (JP2)

The CompactFlash interface uses a primary IDE channel, which could be set as the master or slave device by changing the setting of JP1.

**Master Device: (Default)**




**Slave Device:**




UNO-2053 has one internal CompactFlash card slot and one external CompactFlash card slot. Internal CompactFlash card slot supports CompactFlash type I (3mm thick) only and External CompactFlash card slot supports both Type I and type II (5mm thick) cards

A 32 MB CompactFlash card is equipped in the UNO-2053CE with Windows CE .NET OS. For UNO-2053, there is no CompactFlash card on the slot. UNO-2053 also supports IBM Microdrive storage device, which is an ultra-miniature hard disk from IBM that was introduced in 1998. The Microdrive is built into a Type II CompactFlash form factor.

## A.9 Enhanced IDE connctor (CN2)

**Table A-8: IDE hard drive connector**

| Pin | Signal Name | Pin | Signal Name |
|---|---|---|---|
| 1 | IDE RESET | 2 | GND |
| 3 | DATA 7 (*2) | 4 | DATA 8 (*2) |
| 5 | DATA 6 (*2) | 6 | DATA 9 (*2) |
| 7 | DATA 5 (*2) | 8 | DATA 10 (*2) |
| 9 | DATA 4 (*2) | 10 | DATA 11 (*2) |
| 11 | DATA 3 (*2) | 12 | DATA 12 (*2) |
| 13 | DATA 2 (*2) | 14 | DATA 13 (*2) |
| 15 | DATA 1 (*2) | 16 | DATA 14 (*2) |
| 17 | DATA 0 (*2) | 18 | DATA 15 (*2) |
| 19 | SIGNAL GND | 20 | N/C |
| 21 | DMA REQUEST | 22 | GND |
| 23 | IO WRITE (*2) | 24 | GND |
| 25 | IO READ (*2) | 26 | GND |
| 27 | IO CHANNEL READY | 28 | GND (*1) |
| 29 | HDACK | 30 | GND |
| 31 | IRQ | 32 | N/C |
| 33 | ADDR 1 | 34 | N/C |
| 35 | ADDR 0 | 36 | ADDR 2 |
| 37 | HARD DISK SELECT 0 (*2) | 38 | HARD DISK SELECT 1 (*2) |
| 39 | IDE ACTIVE | 40 | GND |
| 41 | VCC | 42 | VCC |
| 43 | GND | 44 | N/C |

## A.10 LCD connector (CN8, Reserved)

**Table A-9: LCD connector**

| Pin | Signal Name | Pin | Signal Name |
|---|---|---|---|
| 1 | NC | 2 | NC |
| 3 | GND | 4 | GND |
| 5 | +5V | 6 | +5V |
| 7 | NC | 8 | GND |
| 9 | +3.3V | 10 | +3.3V |
| 11 | PD0 | 12 | PD1 |
| 13 | PD2 | 14 | PD3 |
| 15 | PD4 | 16 | PD5 |
| 17 | NC | 18 | NC |
| 19 | PD6 | 20 | PD7 |
| 21 | PD8 | 22 | PD9 |
| 23 | PD10 | 24 | PD11 |
| 25 | NC | 26 | NC |
| 27 | PD12 | 28 | PD13 |
| 29 | PD14 | 30 | PD15 |
| 31 | PD16 | 32 | PD17 |
| 33 | GND | 34 | GND |
| 35 | FSCLK | 36 | FVSYNC |
| 37 | ENDISP | 38 | FHSYNC |
| 39 | FPEN | 40 | VBIASEN |
| 41 | NC | 42 | NC |
| 43 | GND | 44 | +5V |

### GND

Ground

### PD0~PD17

**Flat Panel Data Port Lines 17 to 0.** This is the data port to an attached active matrix TFT panel.

### FSCLK

**Flat Panel Clock.** This is the clock for the flat panel interface.

### FVSYNC

**Flat Panel Vertical Sync Output.** This is the vertical sync for an attached active matrix TFT flat panel. This represents a delayed version of the input flat panel vertical sync signal with the appropriate pipeline delay relative to the pixel data.

### FHSYNC

**Flat Panel Horizontal Sync Output.** This is the horizontal sync for an attached active matrix TFT flat panel. This represents a delayed version of the input flat panel horizontal sync signal with the appropriate pipeline delay relative to the pixel data.

### FPEN

**Flat Panel Display Enable Output.** This is the display enable for an attached active matrix TFT flat panel. This signal qualifies active pixel data on the flat panel interface.

### ENDISP

**Display Enable Input.** This signal qualifies active data on the pixel input port. It is used to qualify active pixel data for all display modes and configurations and is not specific.

### VBIASEN

**Flat Panel Backlight Enable Output.** This is the enable signal for the backlight power supply to an attached flat panel. It is under control of the power sequence control logic.

## A.11 Audio connector (JP3, Reserved)

The UNO-2053 on-board audio interface provides high-quality stereo sound and FM music synthesis (ESFM) by using the CX5530 audio controller from Cyrix Corporation. The audio interface can record, compress, and play back voice, sound, and music with a built-in mixer control. The UNO-2053 on-board audio interface also supports the Plug and Play (PnP) standard and provides PnP configuration for audio, FM, and MPU-104 logical devices. It is compatible with AC97 version 2.0, voice, and music functions. The ESFM synthesizer is registering compatible with the OPL3 and has extended capabilities.

The UNO-2053 provides all major signals on a 16-pin flat-cable connector (JP3). These audio signals include Microphone in (mono), Line in (stereo) and Speaker out (stereo).

**Table A-10: Audio connector**

| Pin | Signal Name | Pin | Signal Name |
|---|---|---|---|
| 1 | NC | 2 | NC |
| 3 | NC | 4 | NC |
| 5 | R_OUT+ | 6 | L_OUT+ |
| 7 | GND | 8 | GND |
| 9 | LINE_IN_R | 10 | LINE_IN_L |
| 11 | GND | 12 | GND |
| 13 | NC | 14 | VCCSREF_C |
| 15 | MIC1_C | 16 | GND |