# AVR32LA32 Curiosity Nano User Guide

## AVR32LA32 Curiosity Nano

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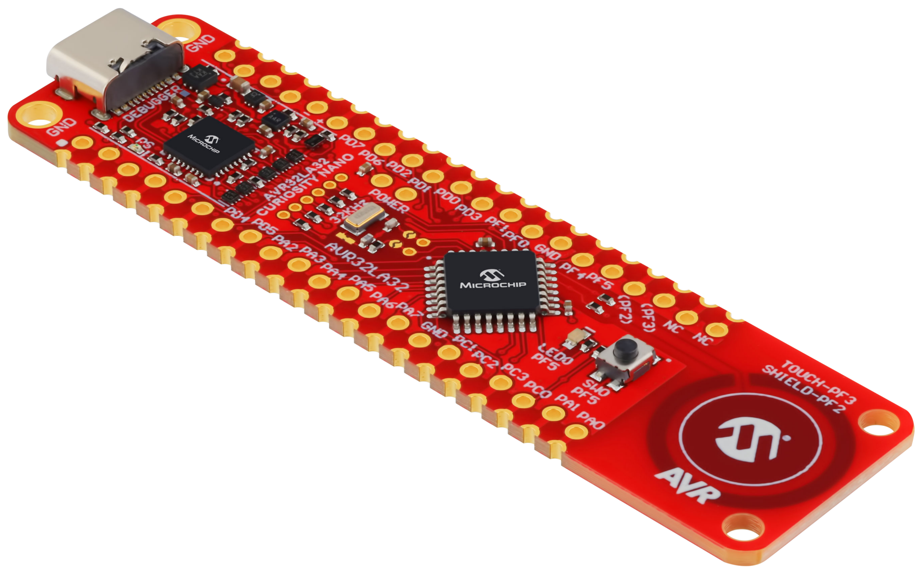
## Preface

The AVR32LA32 Curiosity Nano evaluation kit (EV24D63A) is a hardware platform for evaluating the AVR® LA family. This board features the AVR32LA32 (referred to as the target device in this document) mounted on the board.

The Curiosity Nano series of evaluation boards include an on-board programmer and debugger. No external tools are necessary to program and debug the AVR32LA32.




| | | |
|---|---|---|
| • **Kit Website** | - | Kit information, the latest user guide, and design documentation. |
| • **Device Website** | - | Find documentation, data sheets, samples, and purchase devices. |
| • **Microchip Direct** | - | Purchase this kit from Microchip Direct. |
| • **MPLAB® Discover** | - | Get started with code examples on MPLAB® Discover. |
| • **Schematics** | - | Board schematics and revision history. |
| • **Design Documentation** | - | Production files for every revision. |

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# 1. AVR32LA32 Key Features

The AVR® LA microcontroller family uses the latest technologies from Microchip Technology and features a flexible, low-power architecture, including an Event System, accurate analog subsystems, advanced digital peripherals, and Peripheral Touch Controller.

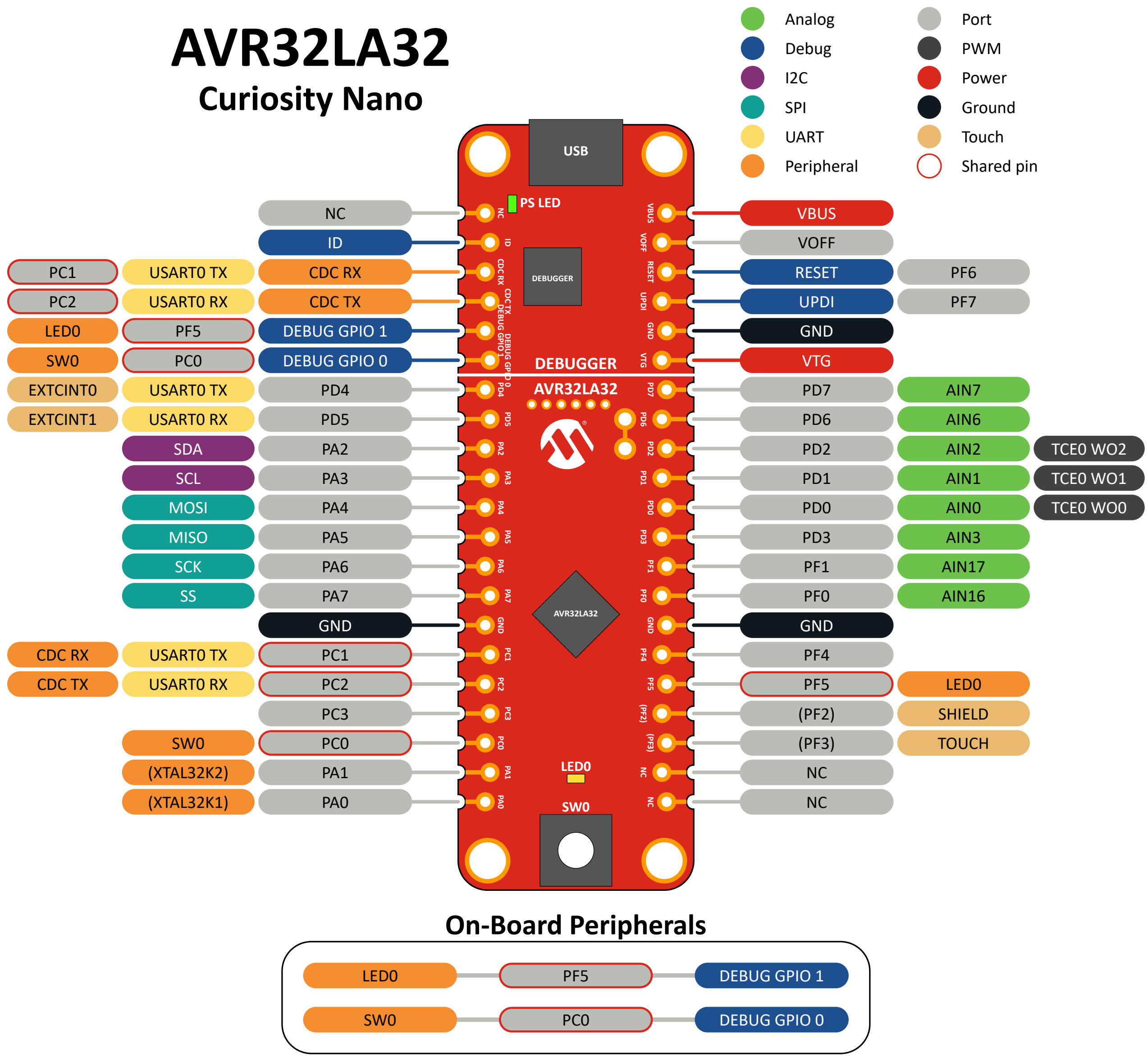
- AVR® CPU Running at Up to 20 MHz
- 32 KB of In-System Programmable (ISP) Flash Memory, with 2 KB SRAM and 512B EEPROM
- Supply Voltage Range: 1.62V to 5.5V
- PTC with Driven Shield+ and Boost Mode Technologies for Capacitive Touch Buttons, Sliders, Wheels and 2D Surface
  - Supports up to 27 self-capacitance touch channels
- 10-bit Analog-to-Digital Convertor (ADC)
- Analog Comparator
- Three 16-bit Timer/Counters
- USART, SPI, and I$^2$C Serial Communication Interfaces
- Four-Channel Event System
- Configurable Custom Logic (CCL) with Four Look Up Tables (LUTs)
- Program and Debug Interface Disable (PDID)
- Pin Counts: 14, 20, 28 and 32
- Temperature Ranges:
  - Industrial: −40°C to +85°C
  - Extended: −40°C to +125°C

# 2. Pinout

AVR32LA32 Curiosity Nano pinout diagram.

All the AVR32LA32 I/O pins are accessible at the edge connectors on the board. The image below shows the board's pinout.

**Figure 2-1.** AVR32LA32 Curiosity Nano Pinout




**Info:** Refer to the I/O Multiplexing and Considerations section in the AVR32LA32 data sheet for all available functions on each pin.

# 3. Board Features

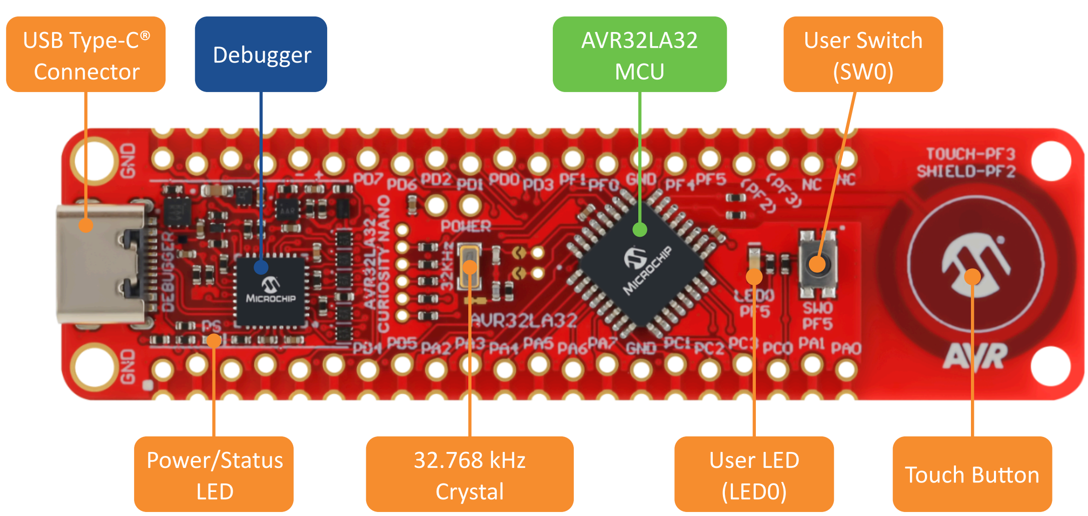
Features of Curiosity Nano, board layout picture, board block diagram, and Curiosity Nano pinout standard.

## 3.1. Board Features

- AVR32LA32 Microcontroller
- On-Board Nano Debugger
  – Programming and debugging
  – Virtual serial port via USB CDC
  – Green power and status LED
  – Two debug GPIO channel (DGI GPIO)
  – Board identification in Microchip development environments
- Power and Connectivity
  – USB Type-C® for power and data
  – Adjustable target voltage (1.62–5.5V, up to 500 mA) controlled by the on-board debugger
- Hardware Peripherals
  – Yellow user LED
  – Mechanical user switch
  – Touch button
  – 32.768 kHz Crystal
- Curiosity Nano Edge Connector
  – Sockets into Curiosity Nano base boards
  – Staggered layout for press fit pin headers
  – Breadboard-compatible
  – Castellated edges for surface mounting

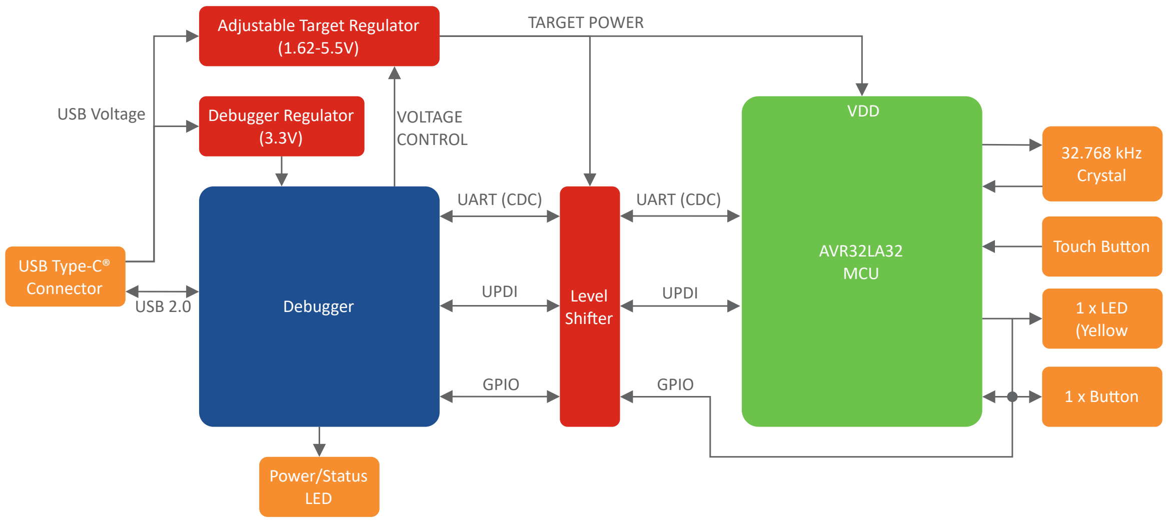
## 3.2. Board Overview

**Figure 3-1.** AVR32LA32 Curiosity Nano Board Overview



## 3.3. Block Diagram

**Figure 3-2.** AVR32LA32 Curiosity Nano Board Block Diagram




## 3.4. Curiosity Nano Pinout

All Curiosity Nano boards follow a standardized pinout for key functions, as illustrated in the image below. Specific pins are reserved for the debugger interface, which supports programming protocols such as UPDI, SWD, or ICSP. Additional dedicated pins are provided for the CDC virtual serial port and the Data Gateway Interface (DGI).

Serial communication interfaces are consistently mapped to designated pins:

- UART
- I2C
- SPI

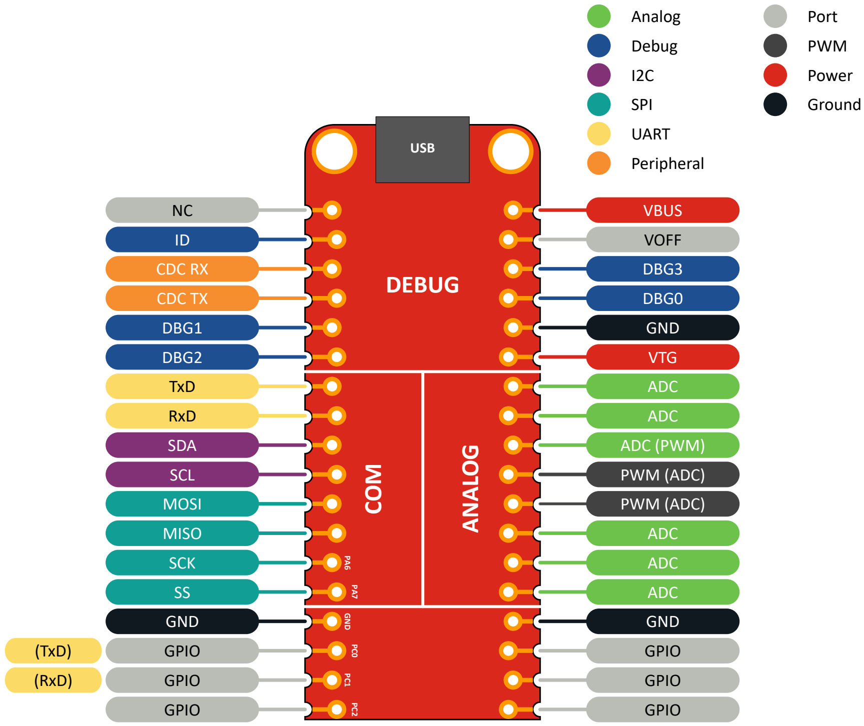
The CDC UART may share pins with the serial communication section, be available on dedicated pins located directly below the serial section, or, in some cases, be accessible only through the debugger section.

Analog capability is guaranteed only for pins within the analog section. At least two of these pins support PWM output, and some kits may offer a third optional PWM pin.

The placement and availability of additional features, such as extra serial or analog functions, may vary depending on the specific Curiosity Nano board. For this reason, only GPIO functionality is guaranteed for pins outside the sections mentioned above.

**Tip:** The location of debugger, serial communication, and analog pins on the edge connector is consistent across all Curiosity Nano boards, ensuring compatibility and ease of use.

**Figure 3-3.** Curiosity Nano Pinout




**Info:** Features shown in parentheses are optional and may not be available on all Curiosity Nano boards.

# 4. Out-of-Box Demo

This is an interactive demo program.

The AVR32LA32 is pre-programmed with an example application that demonstrates GPIO control, capacitive touch, a mechanical switch, and UART communication. The example application features two interactive programs, with Program 1 as the default program.

- **Program 1: LED Blink**

  This program toggles the LED blink frequency between 0.5 Hz and 2.5 Hz when either the switch or the touch button is pressed, with 0.5 Hz as the default frequency.
- **Program 2: Ramp-Up Graph**

  This program plots a ramp-up signal on the MPLAB Data Visualizer time plot while a touch is detected, with the signal increasing over the touch duration. When no touch is detected, the plot remains at zero.

The Program selection is controlled via the kit's CDC UART interface. To interact with the application, open a COM port terminal with the following settings: 115200 baud, 8 data bits, 1 stop bit, and no parity.

Switch between the programs by sending '1' or '2' for the respective program; any other input will reprint the menu.

For full details, see: AVR32LA32 Curiosity Nano Out-of-Box Demo

# 5. Setup Essentials

Step-by-step project setup and pin-header assembly instructions.

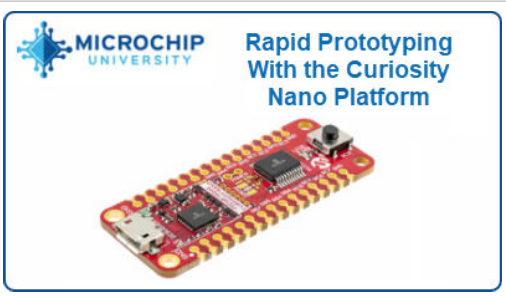
## 5.1. Quick Start

1. Choose your preferred integrated development environment (IDE):
   - MPLAB® Tools for VS Code®
   - Partner Toolchains: Microchip supports a range of partner toolchains. For more information and a list of supported tools, visit the Development Tool Partners page.
2. For VS Code follow these steps:
   a. Download and install VS Code for your operating system.
   b. Install MPLAB Tools for VS Code.
   c. Browse and select an example project using MPLAB® Discover
   d. Download and open the selected example project in VS Code.
   e. Connect the AVR32LA32 Curiosity Nano to your computer using a USB cable.
   f. Program the target device with the example code using MPLAB Tools for VS Code.
   g. Refer to this this guide for tips and tricks on using the extensions.

**Next Steps**

- Explore additional example projects in MPLAB® Discover and try customizing them for your application
- Use the AVR32LA32 Curiosity Nano with a Curiosity Nano Base Board:
  - Curiosity Nano Explorer
  - Curiosity Nano Base for Click Boards™
- Monitor data output:
  - Use the integrated terminal in VS Code or your preferred terminal to access the UART interface on your board
  - For advanced data monitoring and visualization, use MPLAB Data Visualizer

**Tip:** Take a look at this free Microchip University course.




The Curiosity Nano platform enables rapid prototyping and includes built-in debugging for working with new microcontrollers.

## 5.2. Using Pin Headers

The edge connector footprint on the AVR32LA32 Curiosity Nano has a staggered design, where each hole is shifted 8 mils (~0.2 mm) off-center. This hole shift allows the use of standard 100 mil pin headers without soldering them to the board. The pin headers can be used in applications such as pin sockets and prototyping boards once they are firmly in place.

**Figure 5-1.** Connecting Curiosity Nano Board to Base Board Using Pin Headers

**Tip:**

- Start at one end of the pin header and gradually insert the header along the length of the board. Once all the pins are in place, use a flat surface to push them in.
- For applications that permanently use pin headers, it is still recommended to solder them in place
- Once the pin headers are in place, they are difficult to remove by hand. Use a set of pliers and carefully remove the pin headers to avoid damage to the headers, the PCB, or yourself.

# 6. On-Board Nano Debugger

This section describes the features and interfaces of the on-board debugger for programming and debugging.

## 6.1. Overview

The AVR32LA32 Curiosity Nano features an on-board Nano Debugger for programming and debugging. When connected to a host computer, the Nano Debugger appears as a composite USB device offering several interfaces:

- **Debugger:** Enables programming and debugging of the target device.
- **Virtual serial port (CDC):** Provides access to the target device's UART interface.
- **Data Gateway Interface (DGI):** Microchip's proprietary interface for streaming data to the host computer.
- **Mass storage device:** Supports drag-and-drop programming of the target device, provides kit information files and supports utility commands.

**Tip:** For detailed instructions and advanced features, refer to the Nano Debugger Manual.

## 6.2. Power and Status LED

The on-board debugger controls a Power and Status LED (marked PS) on the AVR32LA32 Curiosity Nano board. The table below shows how the different operation modes control the LED.

**Table 6-1.** On-Board Debugger LED Control

| Operation Mode | Power and Status LED |
|---|---|
| Boot Loader mode | The LED blinks slowly during power-up |
| Power-up | The LED is ON |
| Normal operation | The LED is ON |
| Programming | Activity indicator: The LED blinks slowly during programming or debugging |
| Drag-and-drop programming | **Success:** The LED blinks slowly for 2 sec.<br>**Failure:** The LED blinks rapidly for 2 sec. |
| Fault | The LED blinks rapidly if a power fault is detected |
| Off | When the on-board debugger is powered down, the LED is OFF |

**Info:** Slow blinking is approximately 1 Hz, while rapid blinking is about 5 Hz.

## 6.3. Connections

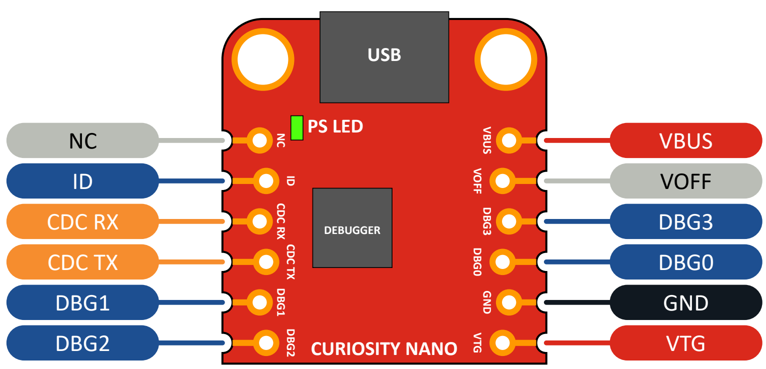
The table below lists the connections between the target device and the debugger. When the debugger is inactive, these connections are set to high-impedance (tri-state) mode. This allows users to use these pins for any function without interference from the debugger. The debugger lines include series resistors to prevent short-circuits and potential damage to the target I/O pins when both the debugger and target attempt to drive a pin simultaneously.

**Info:** The 12 edge connections closest to the debugger USB connector have a standardized pinout, but the function of the programming and debugging pins varies depending on the programming interface used.

**Table 6-2.** On-Board Debugger Connections

| Debugger Pin | AVR32LA32 Pin | | Description |
| --- | --- | --- | --- |
| CDC **TX** | PC2 | USART0 **RX** | USB CDC TX line |
| CDC **RX** | PC1 | USART0 **TX** | USB CDC RX line |
| DBG0 | PF7 | UPDI | Debug data line |
| DBG1 | PF5 | LED0/GPIO1 | Debug GPIO1/LED0 |
| DBG2 | PC0 | SW0/GPIO0 | Debug GPIO0/SW0 |
| DBG3 | PF6 | RESET | Reset line |
| VOFF | — | | Pull VOFF low to disable the on-board regulator and allow external power on VTG; VOFF is monitored by the debugger |
| ID | — | | Identification of supported base boards and extensions at power-up |

**Figure 6-1.** Curiosity Nano Debugger Pinout




**Tip:** For the complete AVR32LA32 Curiosity Nano pinout, see the AVR32LA32 Curiosity Nano Pinout.

## 6.4. Disconnecting the On-Board Debugger

All signals between the on-board debugger and the target device are routed through cut straps on the bottom of the board. These cut straps can be used to disconnect the debugger from the target for various purposes, such as:

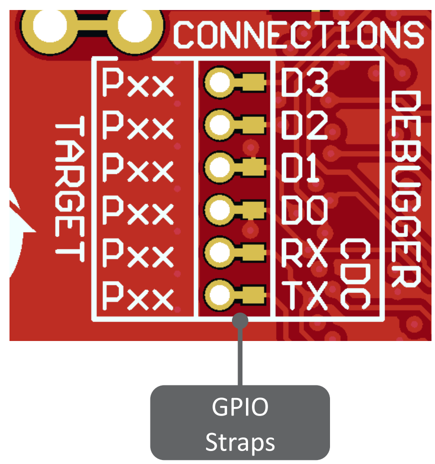
- Evaluating the target device’s power consumption in isolation removes the on-board debugger's influence on current measurements
- Using the target device with an external programmer/debugger
- Using the on-board debugger as a standalone programmer/debugger for other devices

The following cut straps are available to separate the debugger from the target:

- Debugger Pins (J101, J102, J103, J104, J105, J106)
- Power

**Attention:** Cutting the GPIO straps to the on-board debugger disables the virtual serial port, programming, debugging, and data streaming functions.

**Figure 6-2.** Curiosity Nano Debugger Cut Straps

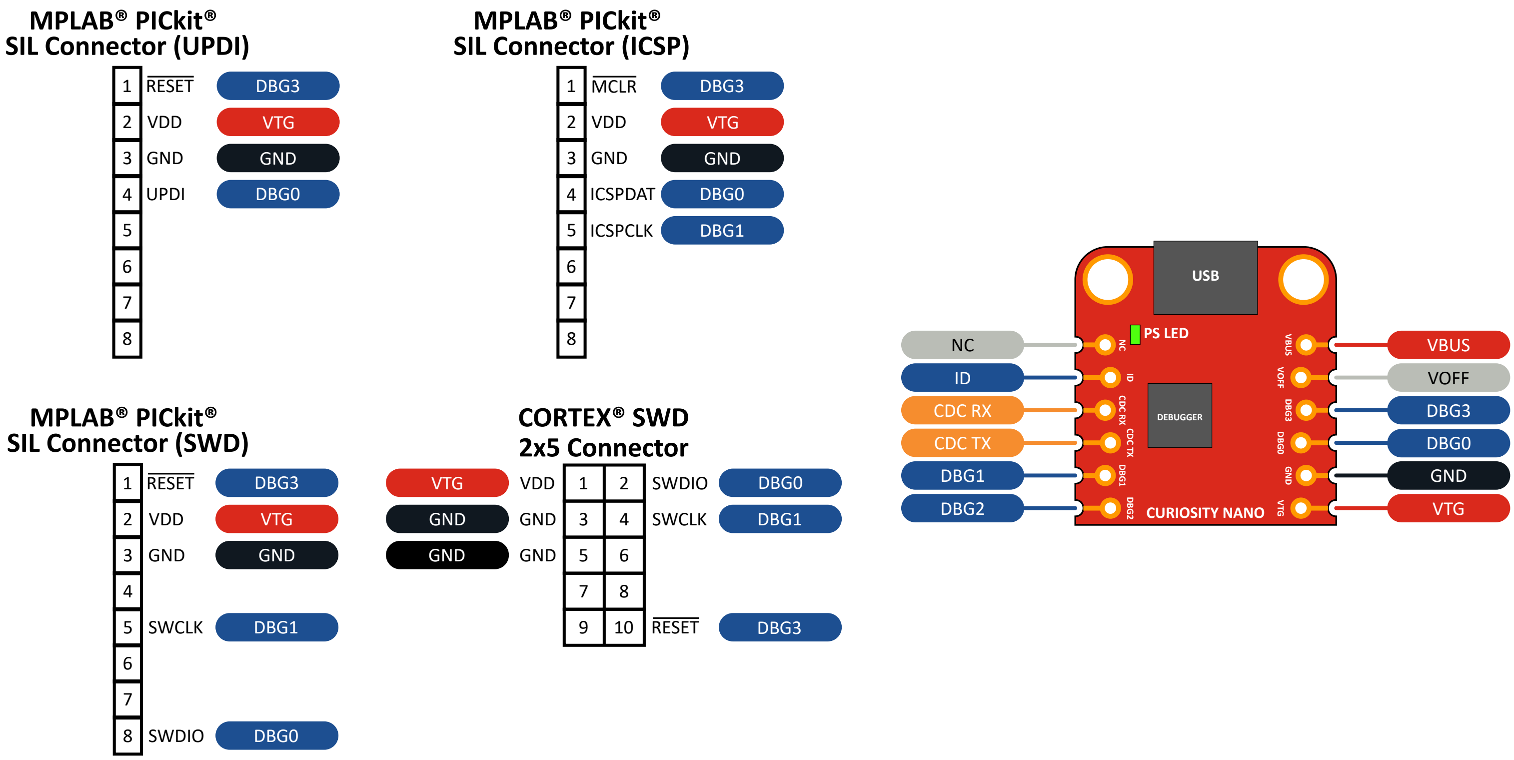



**Tip:** To reconnect any cut connections, use solder or mount a 0 Ω 0402-size resistor across the cut strap.

## 6.5. Connecting External Debuggers

Although the board includes an on-board debugger, external debuggers can also be connected directly to the target device for programming and debugging. When the on-board debugger is not actively in use, it keeps all pins connected to the board edge and the target device in a tri-state condition. This ensures that the on-board debugger does not interfere with any external debug tools.

**Figure 6-3.** Connecting an External Debugger/Programmer to a Curiosity Nano Board




**CAUTION** To prevent contention, do not use the on-board debugger for programming or debugging while the external debugger is connected.

# 7. Hardware Peripherals

Kit hardware peripherals overview.

## 7.1. LED

One yellow user LED is available on the AVR32LA32 Curiosity Nano board. It can be controlled by either GPIO or PWM. Driving the connected I/O line to GND will activate the LED.

**Figure 7-1.** AVR32LA32 Curiosity Nano LED0 Block Diagram

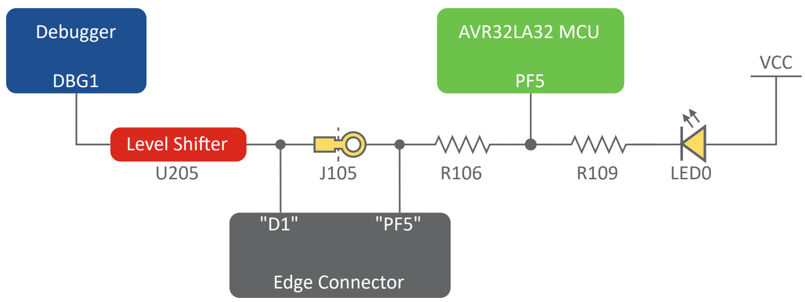


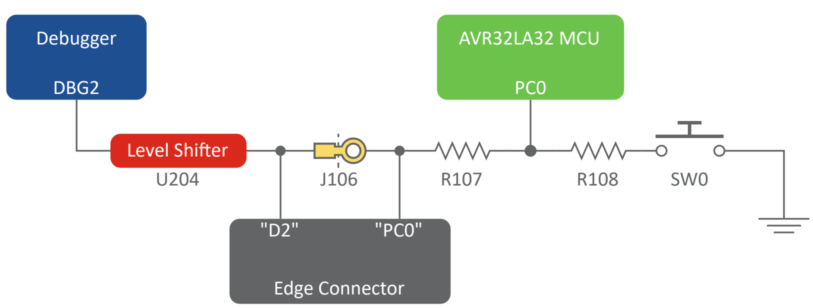

**Table 7-1.** LED Connection

| AVR32LA32 Pin | Description | Default Connection |
|---|---|---|
| PF5 | User LED (yellow), active low | • LED0<br>• Edge connector<br>• On-board debugger |

## 7.2. Mechanical Switch

The AVR32LA32 Curiosity Nano board has one mechanical switch - a generic, user-configurable switch. Pressing it connects the I/O pin to ground (GND).

**Figure 7-2.** AVR32LA32 Curiosity Nano SW0 Block Diagram




**Tip:** There is no externally connected pull-up resistor on the switch. Enable the internal pull-up resistor on Pin PC0 to use it.

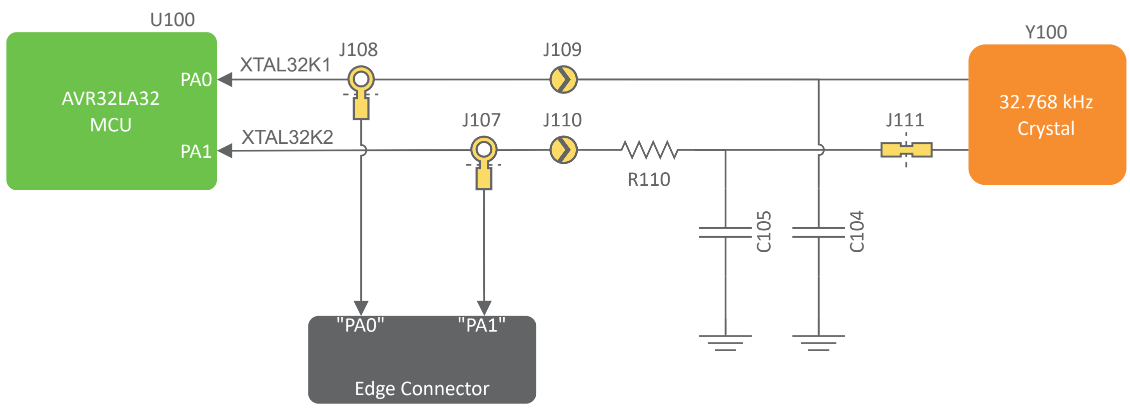
**Table 7-2.** Mechanical Switch Connection

| AVR32LA32 Pin | Description | Default Connection |
|---|---|---|
| PC0 | User switch (SW0), supports DGI event monitoring | • SW0<br>• Edge connector<br>• On-board debugger |

## 7.3. Crystal

The AVR32LA32 Curiosity Nano Board has a 32.768 kHz crystal mounted. The crystal is not connected to the target device by default, as the GPIO pins are routed to the edge connector.

**Figure 7-3.** 32.768 kHz Crystal Block Diagram




**Note:** The 32.768 kHz crystal on the AVR32LA32 Curiosity Nano is included for use and testing with the AVR32LA32 External 32.768 kHz Oscillator (XOSC32K) configured in High-Power mode. R110 is added to limit the oscillator's drive strength.

**Table 7-3.** Crystal Connections

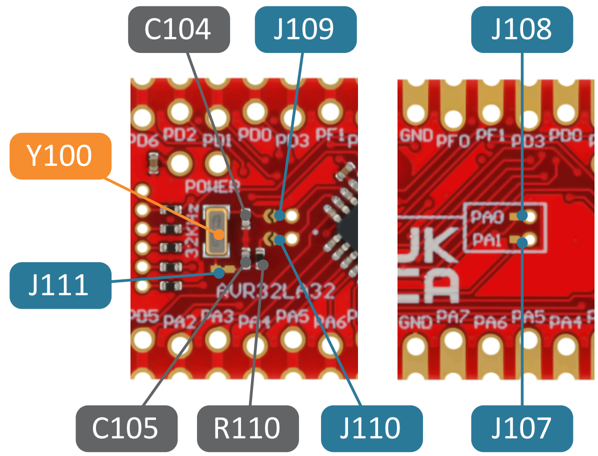
| AVR32LA32 Pin | Description | Default Connection |
|---|---|---|
| PA0 | Crystal input, XTAL32K1 | Edge connector |
| PA1 | Crystal output, XTAL32K2 | |

**WARNING** Always disconnect the board from all power sources making any hardware modifications.

### How to Connect the Crystal to the Target Device

1. Disconnect the two I/O lines routed to the edge connector by cutting the two cut straps on the bottom side of the board, J107 and J108.
2. Connect the two I/O lines to the crystal by soldering a blob onto each circular solder point on the top of the board, J109 and J110.

**Figure 7-4.** 32.768 kHz Crystal Overview

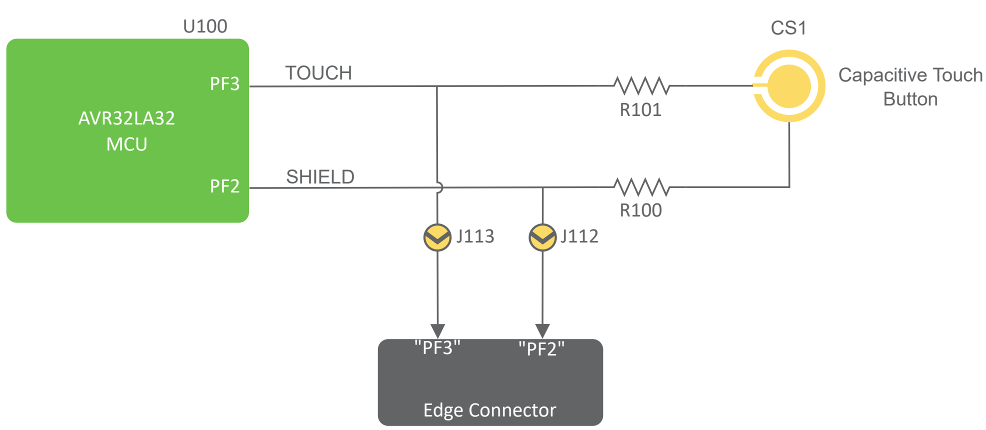



The 32.768 kHz crystal has a cut strap (J111), that can be used to measure the oscillator safety factor. This is done by cutting the strap and adding a 0402 SMD resistor across it. The AN2648 application note from Microchip provides more information about oscillator allowance and safety factors.

## 7.4. Touch

The AVR32LA32 Curiosity Nano board has a single capacitive touch button with an active shield. For details on configuration and usage, refer to the Peripheral Touch Controller (PTC) chapter in the AVR32LA32 device data sheet.

**Figure 7-5.** AVR32LA32 Curiosity Nano Touch Button Block Diagram




**Tip:** Generate code using the capacitive touch library in MPLAB® Harmony and visualize touch sensor data in MPLAB® Data Visualizer.

**Table 7-4.** Capacitive Touch Button Connection

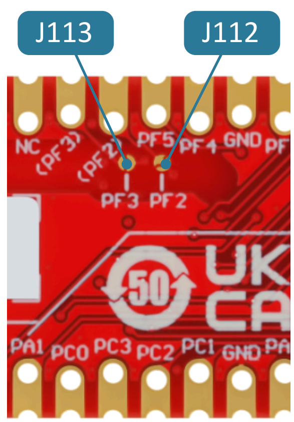
| AVR32LA32 Pin | Description | Default Connection |
|---|---|---|
| PF2 | Shield connection for improved noise immunity | • Touch button shield<br>• Edge connector (disconnected by default) |
| PF3 | Capacitive touch connection | • Touch button sensor<br>• Edge connector (disconnected by default) |

**WARNING** Always disconnect the board from all power sources before making any hardware modifications.

By default, the touch lines are not connected to the edge connector. PF2 and PF3 can be re-purposed for other functions by soldering the corresponding pads (J112 and J113) located on the bottom of the board to connect them to the edge connector.

**Important:** This modification will affect the touch button’s performance and may cause it to not function as intended.

**Figure 7-6.** Touch I/O Line Solder Points



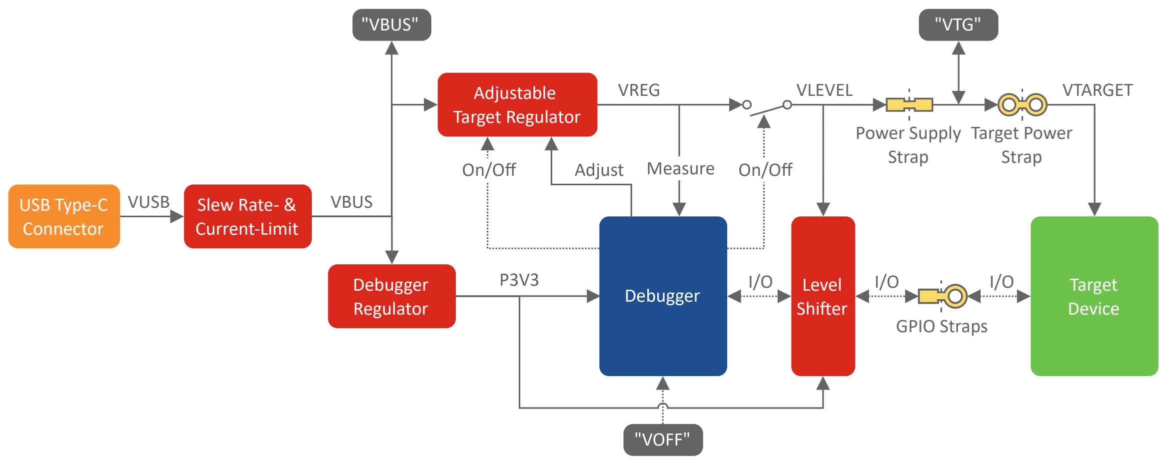
# 8. Power Supply

The USB port serves as the primary power source for the board. The power supply uses two LDO regulators: A fixed 3.3V regulator for the on-board debugger and an adjustable regulator for the target device and its peripherals.

When the USB is connected, there is a 1 ms start-up delay before power is applied, and a dedicated current-limiting IC restricts the supply current to approximately 500 mA to protect the board and connected devices. The figure below shows the full power supply design of the AVR32LA32 Curiosity Nano.

The maximum input voltage to the target device depends on both the USB input voltage and the on-board debugger's configuration. While the debugger can be set to allow up to 5.5V, the actual voltage will never exceed the USB input, which typically ranges from 4.4V to 5.25V. The lower of these two values determines the maximum voltage available to the target device.

**Figure 8-1.** Power Supply Block Diagram




## 8.1. Target Regulator

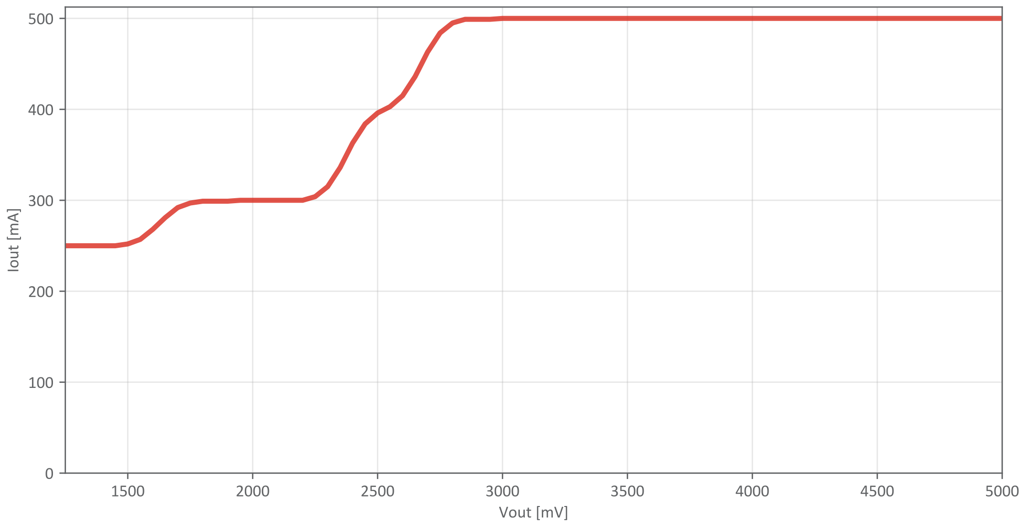
The MIC5353 variable output LDO supplies power to the target section. The on-board debugger controls the regulator's output voltage by adjusting its feedback. The on-board debugger restricts the output voltage to the safe operating range of the AVR32LA32 (1.62–5.5V).

By default, the board is configured to run at 3.3V. This setting can be changed in Microchip IDEs, and any changes made will persist through power cycles. The board voltage can be adjusted using one of the following methods:

- **Microchip IDE:** Configure the voltage setting in the IDE. Voltage changes are applied when the debugger is accessed (e.g., during programming, reading memory, or refreshing tool status).
- **Drag-and-drop command files:** Set common voltages quickly using command files. For details, see Nano Debugger Manual.
- **pymcuprog:** Use the pymcuprog tool to set the board voltage

The MIC5353 can supply up to 500 mA, but the actual maximum current may be lower due to thermal shutdown, which depends on input voltage, output voltage, and ambient temperature. The figure below illustrates the maximum output current limits of the regulator at a 5.1V input and 23°C ambient temperature.

**Figure 8-2.** MIC5353 Maximum Output Current vs. Output Voltage at 5.1V Input, 23°C Ambient




The on-board debugger monitors target voltage. If the voltage deviates by more than ±100 mV from the set target voltage, or if external voltage is applied to VTG without VOFF pulled low, the on-board debugger disables the regulator and blinks the status LED rapidly. See the Nano Debugger Manual for more details.

## 8.2. External Supply

The AVR32LA32 Curiosity Nano can be powered by an external voltage through the VTG pin, as an alternative to the on-board target regulator.

To safely use external power, follow these steps:

- Pull the VOFF pin to GND to disable the on-board regulator
- Apply external voltage to the VTG pin

**WARNING**

- Never apply voltage to VOFF; leave it floating to enable the on-board supply
- Only apply external voltage to VTG after pulling VOFF to GND. Failing to do so may cause damage to the board

The on-board debugger monitors the supplied voltage. If VOFF is not pulled to ground and the external voltage differs by more than ±100 mV from the regulator setting, the debugger disables the regulator and begins blinking the status LED rapidly. When the voltage returns to within ±100 mV, normal operation resumes and the LED stops blinking.

Programming, debugging, and data streaming with external power are only supported when the USB cable is connected, as it supplies power to the debugger and level shifters. With the USB connected, about 100 µA is drawn from the external supply for level shifters and voltage monitoring. If the USB cable is disconnected, the level shifters may draw up to 5 µA (typically as little as 100 nA).

**Table 8-1.** Voltage Limits

| Parameter | Value |
|---|---|
| AVR32LA32 operating range | 1.62–5.5V |

**Table 8-1.** Voltage Limits (continued)

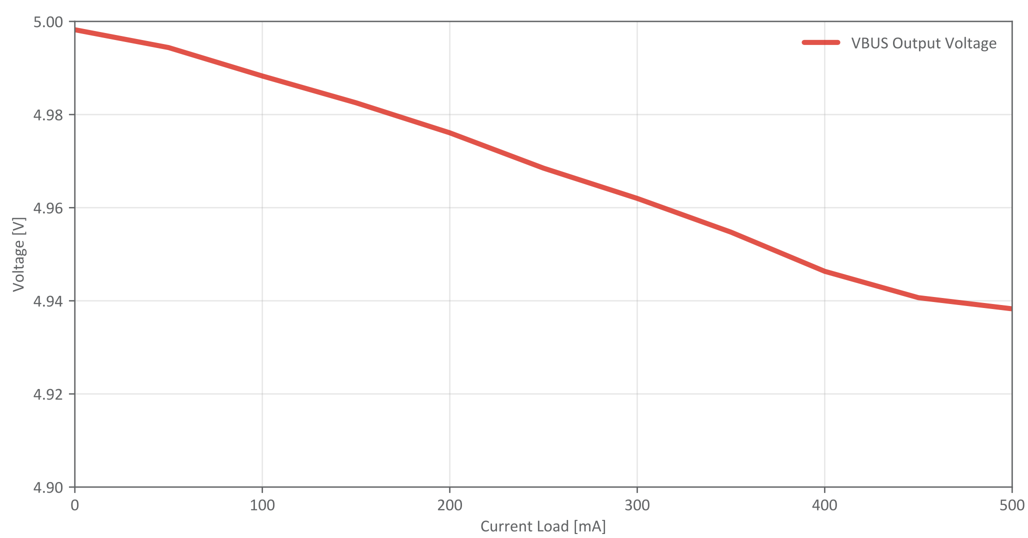
| Parameter | Value |
|---|---|
| Absolute maximum external voltage | 5.5V |

**WARNING** Exceeding these limits may result in permanent damage to the board.

## 8.3. VBUS Output Pin

The AVR32LA32 Curiosity Nano provides a VBUS output pin that supplies 5V for powering external components. The VBUS voltage is not regulated and directly follows the USB input voltage, which may vary depending on the USB source. VBUS is protected by the same start-up delay and current limiting described in the Power Supply chapter. Be aware that as the current load on the VBUS output increases, the output voltage may decrease. The chart below illustrates how the VBUS output voltage varies with different current loads.

**Figure 8-3.** Load Current Impact on VBUS Output Voltage at 5V USB




## 8.4. Cut Straps

Curiosity Nano boards feature two cut straps for power measurement and isolation:

**J200 - Power Supply Strap:**

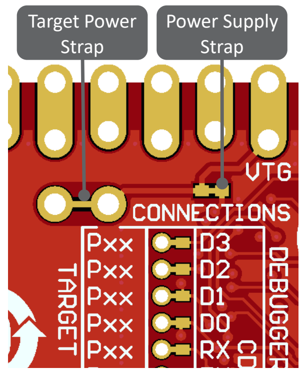
Cutting this strap fully separates the target power from the level shifters and on-board power supply. This allows for accurate current measurements when using an external power supply.

**Info:** Leakage back through the load switch is in the microampere range.

**J201 - Target Power Strap:**

For current measurements using the on-board power supply, cut this strap to measure the current drawn by the target. A 100 mil pin header can be mounted to J201 for easier connection of a measuring instrument.

**Figure 8-4.** Power Supply Cut Straps




## 8.5. Low-Power Measurement

Power for the target device is supplied via the on-board regulator or the VTG pin, routed through the Target Power Strap J201. To accurately measure the current consumption of the target device and any connected peripherals, cut the Target Power Strap (J201) on the bottom side and connect an ammeter across it.

To measure the minimum power consumption of the target device, follow these steps:

1. Cut the Target Power Strap (J201) with a sharp tool.
2. Solder a 1x2 100 mil pin header into the footprint.
3. Connect an ammeter across the pin header.
4. Write firmware that:
   a. Tri-states any I/O connected to the on-board debugger.
   b. Sets the target device in its lowest power sleep mode.
5. Program the firmware into the target device.
6. Measure the current draw.

The five on-board level shifters can each leak up to 2 μA, totaling up to 10 μA. To reduce leakage, keep the I/O pins to the level shifters tri-stated. For full isolation, disconnect the level shifters as described here. With the USB connected, the level shifters and voltage monitoring draw about 100 μA; with the USB disconnected, leakage drops to 5 μA or less.

## 8.6. Power Supply Exceptions

This section summarizes most issues that can arise with the power supply.

### Target Voltage Shuts Down

If the target draws too much current, the MIC5353 regulator may trigger thermal shutdown. Reduce the load to restore operation.

### Target Voltage Setting is Not Reached

The MIC5353 output is limited by the USB input voltage (4.4–5.25V). If the set voltage isn't reached, use a higher-quality USB source or supply external voltage via the VTG pin.

### Target Voltage is Different From Setting

Applying external voltage to VTG without pulling VOFF low can cause voltage mismatch. If the voltage deviates by more than ±100 mV, the debugger disables the regulator and the PS LED blinks rapidly. Remove the external voltage to restore normal operation.

### No or Very Low Target Voltage and PS LED is Blinking Rapidly

A full or partial short circuit can cause this and is a specific case of the issue above. Remove the short circuit, and the on-board debugger will re-enable the on-board target voltage regulator.

### No Target Voltage and PS LED is Lit (Case 1)

This situation occurs if the target voltage is set to 0.0V. To fix this, set the target voltage to a value within the specified voltage range for the target device.

### No Target Voltage and PS LED is Lit (Case 2)

This situation can occur when cutting the Power Supply Strap (J200) and/or the Target Power Strap (J201) and leaving them open. Restore the connection by bridging or adding a jumper.

### VBUS Output Voltage is Low or Not Present

Excessive current on VBUS triggers the MIC2009 current limit, cutting off VBUS. Reduce the load to restore output.

# 9. Hardware Revision History and Known Issues

Provides information about the latest board revision, known issues, and differences from previous versions.

## 9.1. Identifying Product ID and Revision

There are two ways to find the revision and product identifier of the AVR32LA32 Curiosity Nano: the kit window in your Microchip development environment or the sticker on the bottom of the PCB.

The kit window appears in Microchip development environments when the AVR32LA32 Curiosity Nano is connected to the computer. In the VS Code® environment, the kit window is accessed through the tool window.

The first nine digits of the serial number, listed under kit information, contain the product identifier and revision.

**Tip:** If closed, the Kit Window can be opened in VS Code® using the Command Palette **(Ctrl + Shift + P**) and typing the command **MPLAB: Show kits view**.

The same information is found on the sticker on the bottom side of the PCB. The data matrix code on the sticker contains a string with the product identifier 02-01431, revision, and serial number.

The product identifier and revision are also printed in plain text as 02-01431/rr, where "rr" represents the revision. The serial number is printed on the following line.

The string in the data matrix code has the following format:

```
nnnnnnnrrfffssssss
```

n = product identifier

r = revision

f = fabrication code

s = serial number

## 9.2. Revision 4

Revision 4 is the initially released version of the board.

**Known issue:** The silkscreen designator for SW0 on the board is incorrect. The correct designator for SW0 is PC0.

# 10. Document Revision History

| Doc. Rev. | Date | Comments |
|---|---|---|
| A | 05/2026 | Initial document release |

# 11. Appendix

Schematic, Assembly Drawing, Adapter Pinout, Programming External MCUs, External Debuggers

## 11.1. Schematic

**Figure 11-1.** AVR32LA32 Curiosity Nano device Schematic

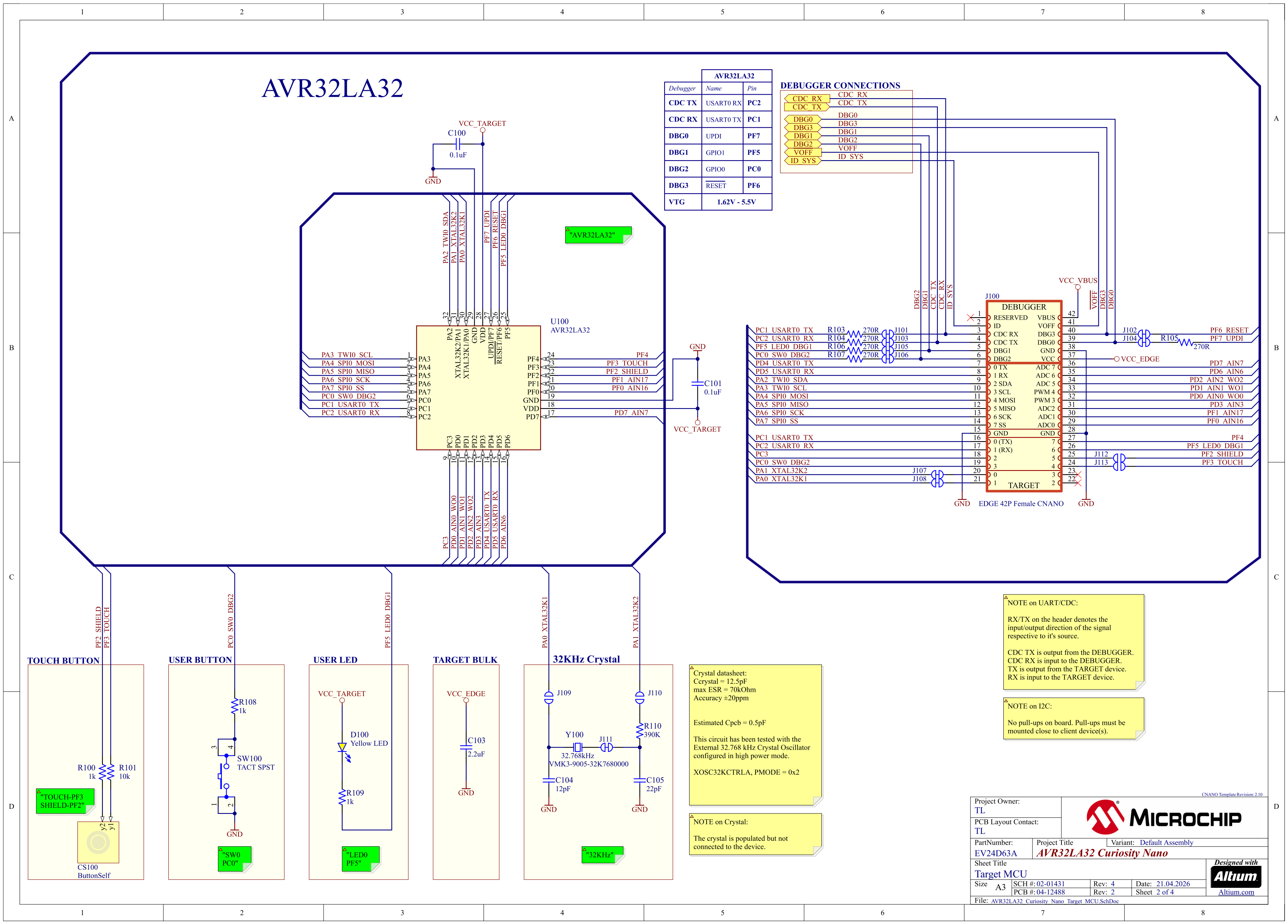
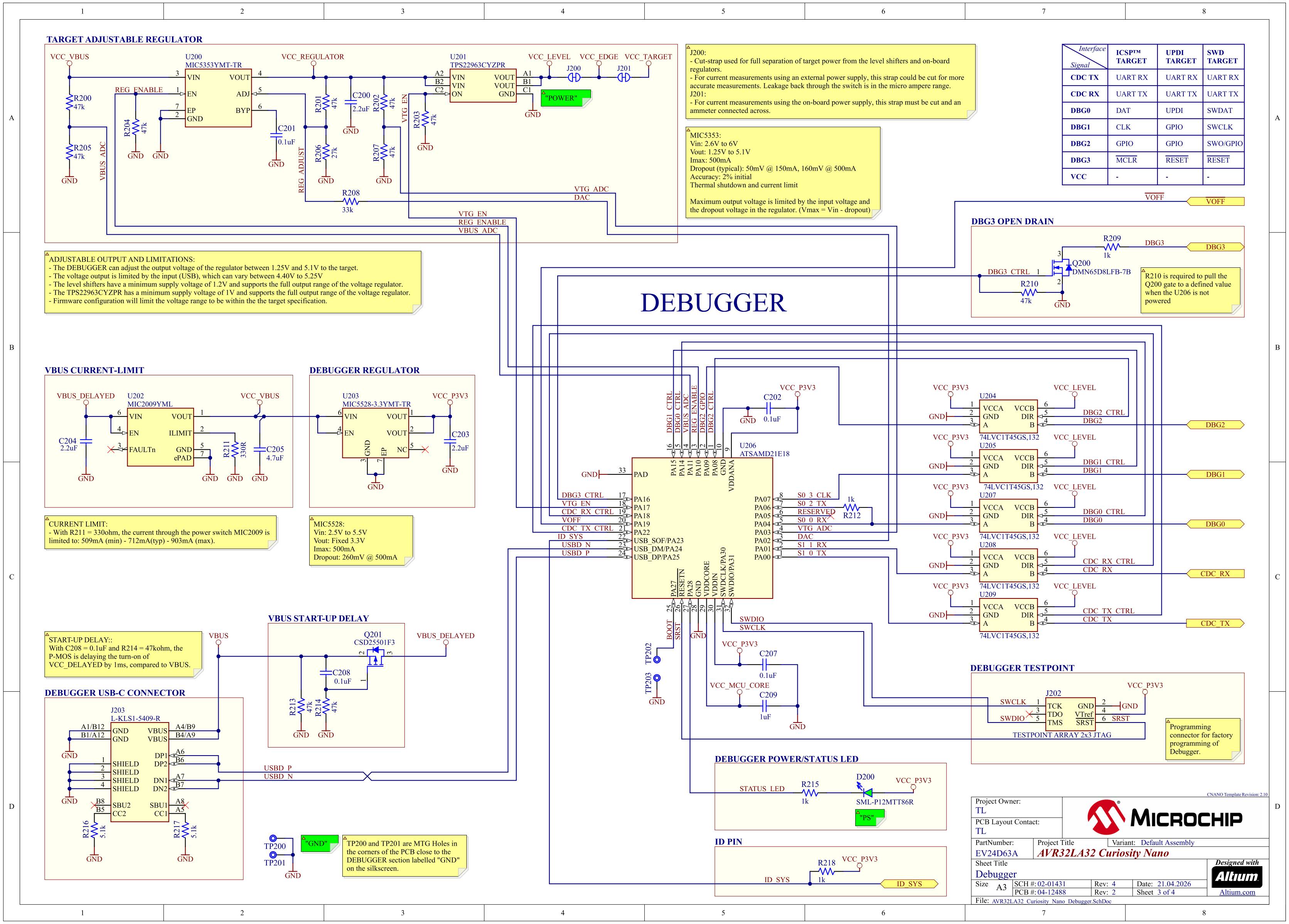


**Figure 11-2.** AVR32LA32 Curiosity Nano Debugger Schematic



## 11.2. Assembly Drawing

**Figure 11-3.** AVR32LA32 Curiosity Nano Assembly Drawing Top

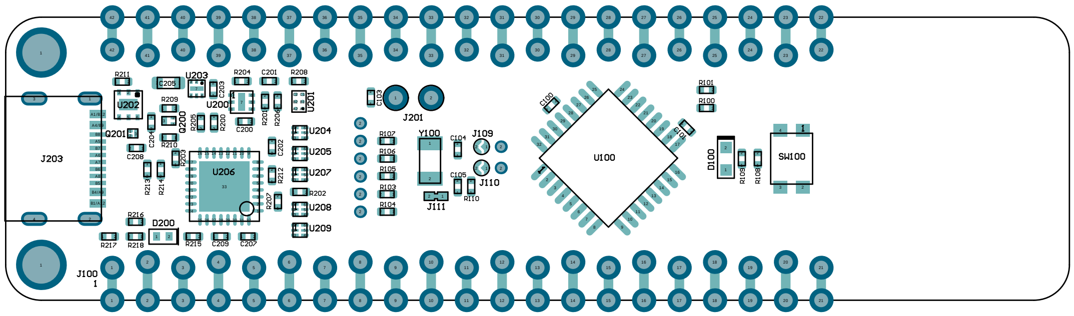
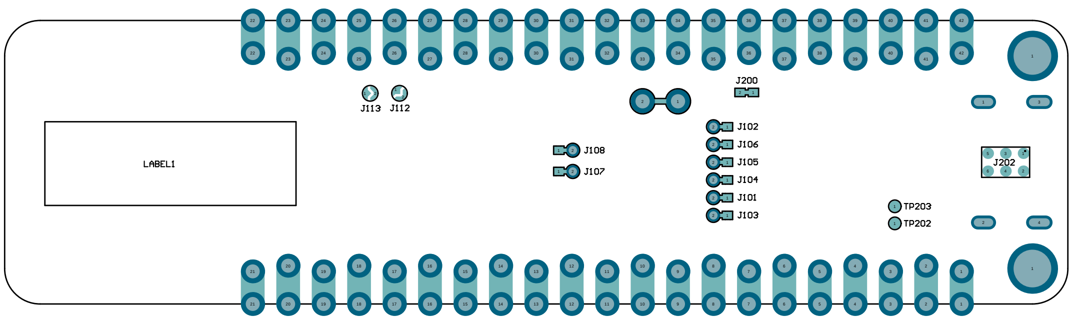
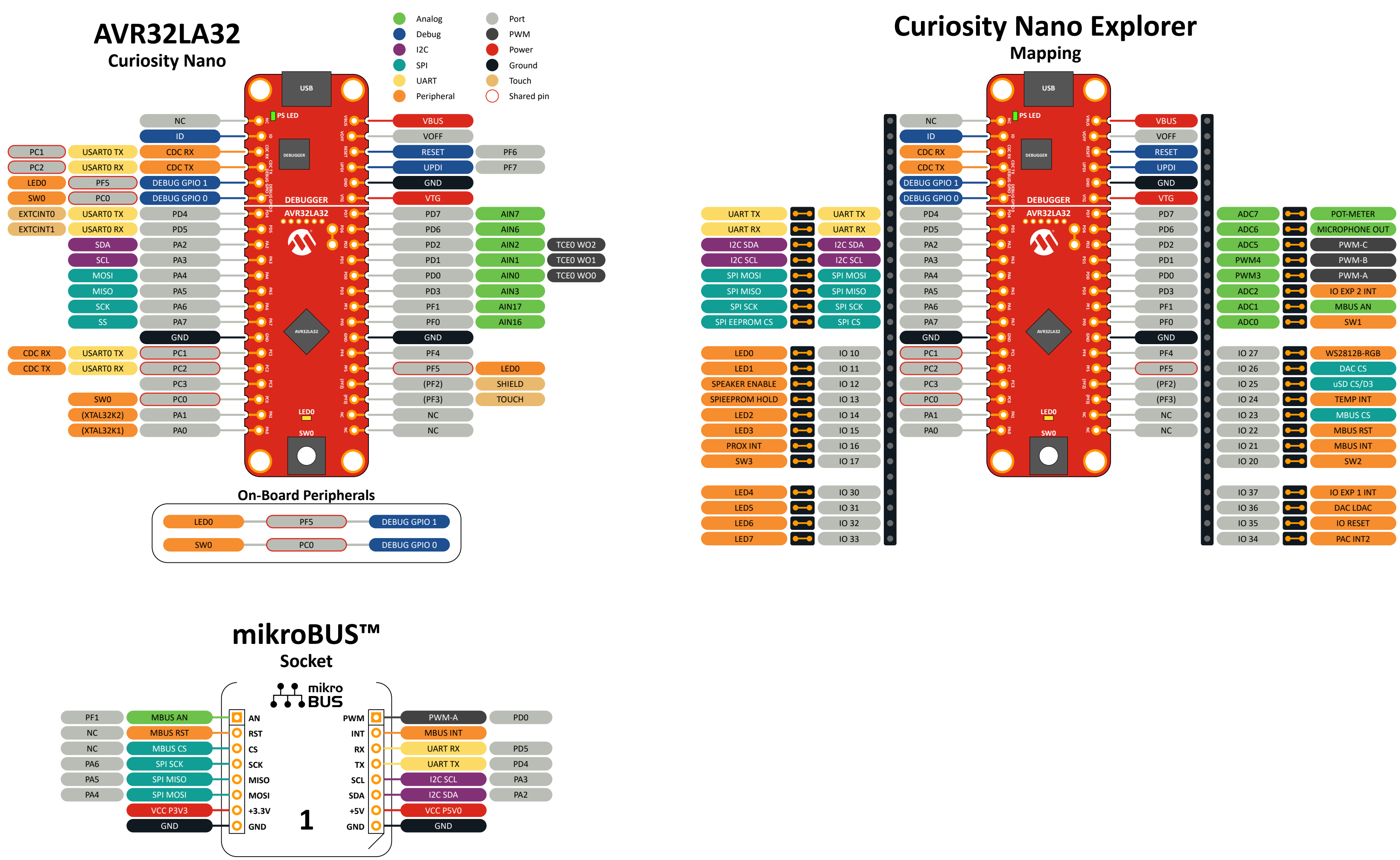



**Figure 11-4.** AVR32LA32 Curiosity Nano Assembly Drawing Bottom



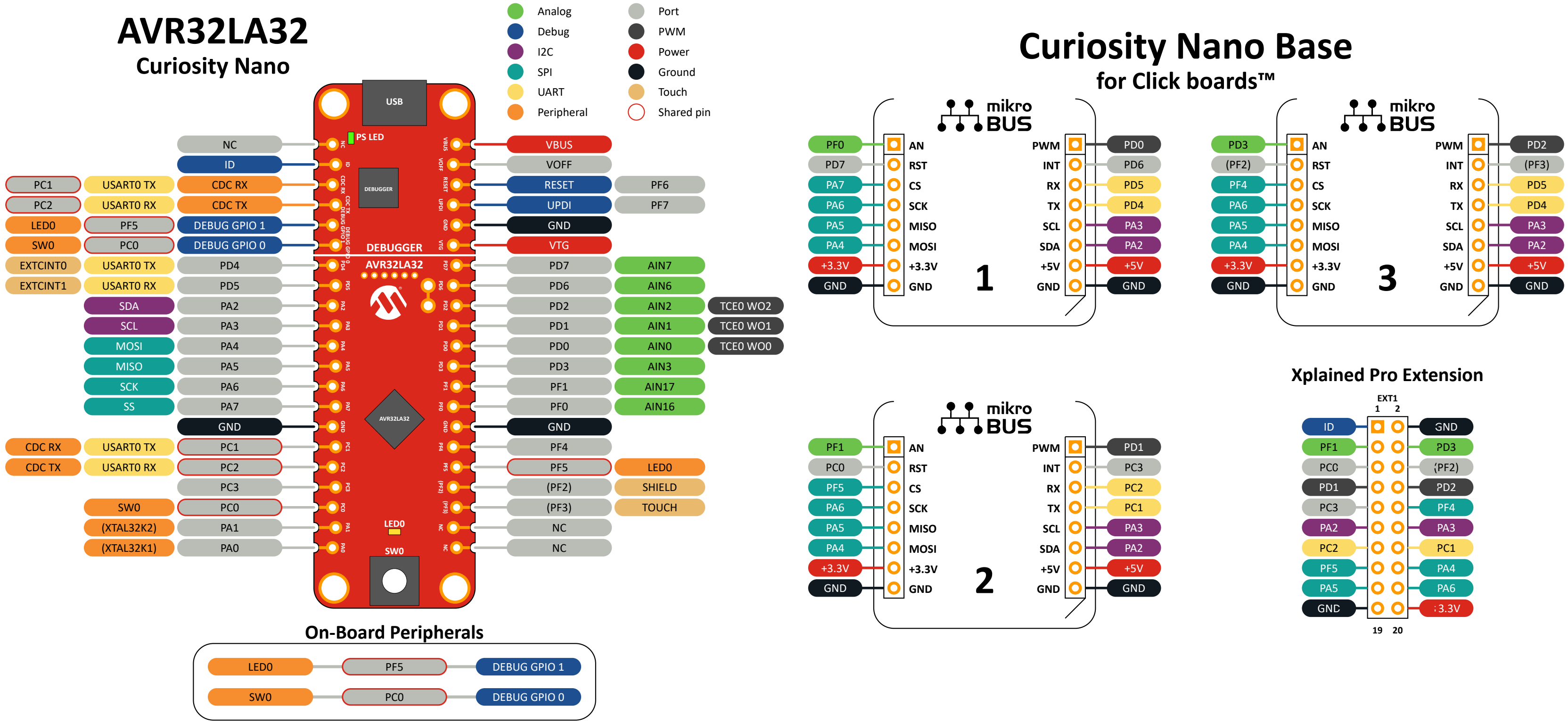
## 11.3. Curiosity Nano Explorer

**Figure 11-5.** Curiosity Nano Explorer Pinout Mapping



## 11.4. Curiosity Nano Base for Click boards™

**Figure 11-6.** AVR32LA32 Curiosity Nano Pinout Mapping



## 11.5. Bill of Materials

**Figure 11-7.** AVR32LA32 Curiosity Nano Bill of Materials

### Component list

**AVR32LA32 Curiosity Nano**

| | |
|---|---|
| **PCBA Number:** | **02-01431** |
| **PCBA Revision:** | **4** |
| **Variant:** | **Default Assembly** |
| Print Date: | 21.04.2026 14:41:03 |

| Fitted | Designator | Quantity | Value | Manufacturer 1 | Manufacturer Part Number 1 | Description_ |
|---|---|---|---|---|---|---|
| Fitted | C100, C101, C201, C202, C207, C208 | 6 | 0.1uF | KEMET | C0402C104K4RAC7867 | CAP CER 0.1uF 16V 10% X7R SMD 0402 |
| Fitted | C103, C200, C203, C204 | 4 | 2.2uF | Murata | GRM155R61A225KE95D | CAP CER 2.2uF 10V 10% X5R SMD 0402 |
| Fitted | C104 | 1 | 12pF | Yageo | CC0402FRNPO9BN120 | CAP CER 12pF 50V 1% NP0 SMD 0402 |
| Fitted | C105 | 1 | 22pF | Murata | GRM1555C1H220JA01D | CAP CER 22pF 50V 5% NP0 SMD 0402 |
| Fitted | C205 | 1 | 4.7uF | Kemet | C0603C475K8PAC7867 | CAP CER 4.7uF 10V 10% X5R SMD 0603 |
| Fitted | C209 | 1 | 1uF | Kemet | C0402C105K9PACTU | CAP CER 1uF 6.3V 10% X5R SMD 0402 |
| Fitted | D100 | 1 | Yellow LED | Rohm Semiconductor | SML-D12Y1WT86 | LED YELLOW DIFFUSED 1608 SMD |
| Fitted | D200 | 1 | LED SINGLE SML-P12MTT86R YELLOW-GREEN | Rohm Semiconductor | SML-P12MTT86R | DIO LED YELLOW-GREEN 2.2V 20mA 25mcd Clear SMD 0402 |
| Fitted | J203 | 1 | USB2.0 Type-C FEMALE | KLS Electronic | L-KLS1-5409-R | CON USB2.0 Type-C Female SMD R/A |
| Fitted | LABEL1 | 1 | PCBA LABEL 18X6mm | ACT Logimark AS | 505462 | LABEL PCBA 18x6mm Datamatrix Assy# / Rev / Serial / Date |
| Fitted | Q200 | 1 | DMN65D8LFB-7B | Diodes Incorporated | DMN65D8LFB-7 | TRANS FET N-CH DMN65D8LFB-7B 260mA 60V 430mW X1_DFN1006-3 |
| Fitted | Q201 | 1 | CSD25501F3 | Texas Instruments | CSD25501F3 | TRANS FET P-CH CSD25501F3 -20V -3.6A 0.076R LGA |
| Fitted | R100, R108, R109, R209, R212, R215, R218 | 7 | 1k | Panasonic | ERJ-2RKF1001X | RES TKF 1k 1% 1/10W SMD 0402 |
| Fitted | R101 | 1 | 10k | TE Connectivity | CRG0402F10K | RES TKF 10k 1% 1/16W SMD 0402 |
| Fitted | R103, R104, R105, R106, R107 | 5 | 270R | KOA Speer | RK73H1ETTP2700F | RES TKF 270R 1% 1/10W SMD 0402 |
| Fitted | R110 | 1 | 390K | Yageo | RC0402FR-07390KL | RES TKF 390K 1% 1/16W SMD 0402 |
| Fitted | R200, R201, R202, R203, R204, R205, R207, R210, R213, R214 | 10 | 47k | Yageo | RC0402FR-0747KL | RES TKF 47k 1% 1/16W SMD 0402 |
| Fitted | R206 | 1 | 27k | Yageo | RC0402FR-0727KL | RES TKF 27k 1% 1/16W SMD 0402 |
| Fitted | R208 | 1 | 33k | Yageo | AC0402FR-0733KL | RES TKF 33k 1% 1/16W SMD 0402 |
| Fitted | R211 | 1 | 330R | Panasonic Electronic Components | ERJ-2RKF3300X | RES TKF 330R 1% 1/10W SMD 0402 AEC-Q200 |
| Fitted | R216, R217 | 2 | 5.1k | Panasonic | ERJ-2RKF5101X | RES TKF 5.1k 1% 1/10W SMD 0402 |
| Fitted | SW100 | 1 | TACT SPST | KLS Electronic | L-KLS7-TS0304A-2-300-T | SWITCH TACT SPST 12V 50mA L-KLS7-TS0304A-2-300-T SMD |
| Fitted | Test1 | 1 | | | | TEST, AVR32LA32 Curiosity Nano |
| Fitted | Test2 | 1 | Debugger Firmware | | | FW, CNANO-DEBUGGER |
| Fitted | U100 | 1 | AVR32LA32 | Microchip Technology | AVR32LA32-I/PT | MCHP MCU 8-BIT 20MHz 32KB 2KB AVR32LA32-I/PT TQFP-32 |
| Fitted | U200 | 1 | MIC5353YMT-TR | Microchip Technology | MIC5353YMT-TR | MCHP ANALOG LDO ADJ 500mA MIC5353YMT-TR MLF-6 |
| Fitted | U201 | 1 | TPS22963CYZPR | Texas Instruments | TPS22963CYZPR | IC SWITCH TPS22963CYZPR LOAD SWITCH 6-DSBGA |
| Fitted | U202 | 1 | MIC2009YML | Microchip Technology | MIC2009YML-TR | MCHP ANALOG POWER SWITCH 5.5V 2A MIC2009YML-TR MLF-6 |
| Fitted | U203 | 1 | MIC5528 3V3 | Microchip Technology | MIC5528-3.3YMT-TR | MCHP ANALOG LDO 3.3V MIC5528-3.3YMT-TR 6-TDFN |
| Fitted | U204, U205, U207, U208, U209 | 5 | 74LVC1T45GS,132 | Nexperia USA Inc. | 74LVC1T45GS,132 | IC VOLTAGE TRANSLATOR BI-DIR 1 CIRCUIT 1 74LVC1T45GS,132 6-XSON , SOT1202 |
| Fitted | U206 | 1 | ATSAMD21E18 | Microchip Technology | ATSAMD21E18A-MUT | MCHP MCU 32-BIT 48MHz 256Kb 32Kb ATSAMD21E18A-MUT QFN-32 |
| Fitted | Y100 | 1 | 32.768kHz | Microchip Technology | VMK3-9005-32K7680000 | MCHP CRYSTAL 32.768kHz 12.5pF VMK3-9005-32K7680000 SMD L3.2W1.5H0.9 |
| | | **64** | | | | |

| **Approved** | **Notes** |
|---|---|
| | |

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