Curiosity Nano Touch Adaptor Kit User's Guide

Introduction

Features and Overview

- Curiosity Nano Footprint
- Two Xplained Pro Extension Headers
- Support for Self and Mutual Cap Touch Extension Kits
- Power:
  - USB-powered from the Curiosity Nano kit
  - Power supply toggle between USB and external source (e.g., battery)
  - Power LED
- Curiosity Hardware Identification System

Kit Compatibility

This kit is compatible with Curiosity Nano Microcontroller (MCU) boards that have a capacitive touch-enabled microcontroller and a matching pinout that connects all extension sensors. The following are currently available microcontroller boards with Microchip Touch Library support:

- PIC16F18446 Curiosity Nano
- PIC18F47Q10 Curiosity Nano
- PIC18F47K42 Curiosity Nano
- PIC18F57Q43 Curiosity Nano
- PIC16F15376 Curiosity Nano
- SAM D21 Curiosity Nano
- AVR128DA48 Curiosity Nano
- ATtiny3217 Curiosity Nano

The following are currently supported extension boards:

- QT2-Xplained Pro (2D Touchpad)
- QT7-Xplained Pro (1D slider and buttons – self-sensing)
- QT8-Xplained Pro (2D Touchpad)
- T10-Xplained Pro (1D slider and buttons – mutual sensing with Boost Mode Touch)

Future Curiosity Nano microcontroller and extension designs will also support the Curiosity Nano Touch Adapter. Refer to the link below in order to find out more on the Curiosity Nano Development Platform:

- https://www.microchip.com/design-centers/8-bit/development-tools/pic-hardware/curiosity-nano-development-platform

The Curiosity Nano Development Platform also offers the Curiosity Nano Base for Click boards™ - an alternative adapter to connect the Curiosity Nano Microcontroller kit to MikroElektronika Click boards™ or XPRO extension boards.

Table of Contents

1. Preface

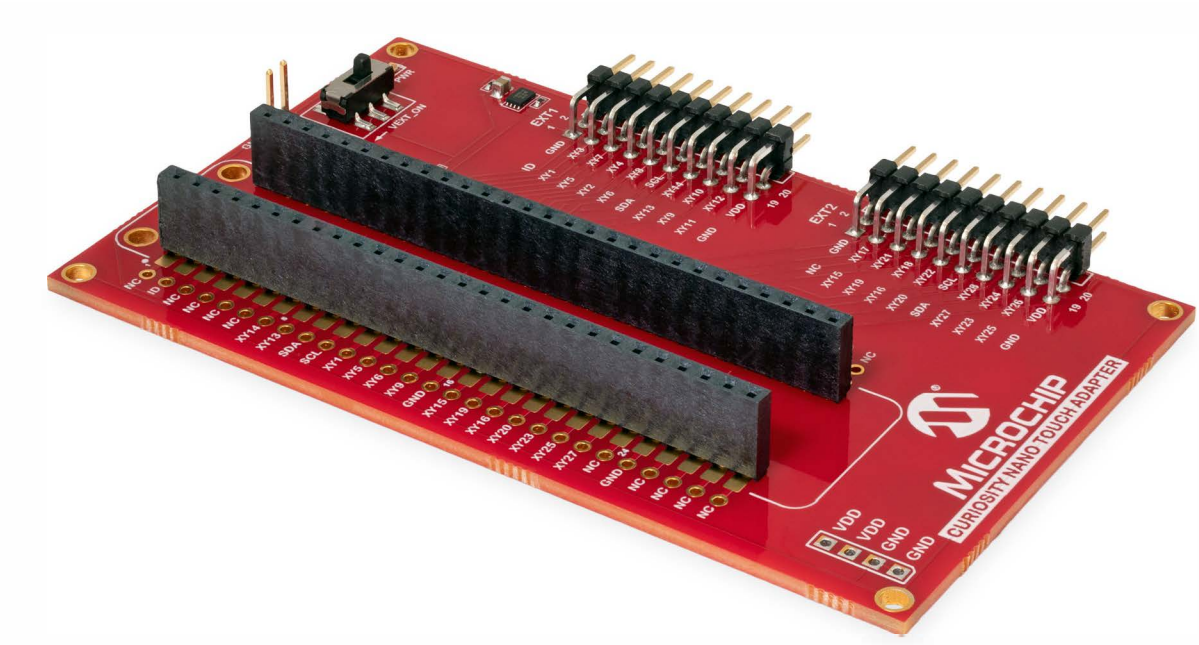
Important: Notice to customers:
All documentation becomes dated, and this manual is no exception. Microchip tools and documentation are constantly evolving to meet customer needs, so some actual dialogs and/or tool descriptions may differ from those in this document. Please refer to our website (www.microchip.com) to obtain the latest documentation available.

Documents are identified with a “DS” number. This number is located on the bottom of each page, in front of the page number. The numbering convention for the DS number is “DSXXXXXA”, where “XXXXX” is the document number and “A” is the revision level of the document.

For the most up-to-date information on development tools, see the MPLAB® IDE online help. Select the Help menu, and then Topics to open a list of available online help files.

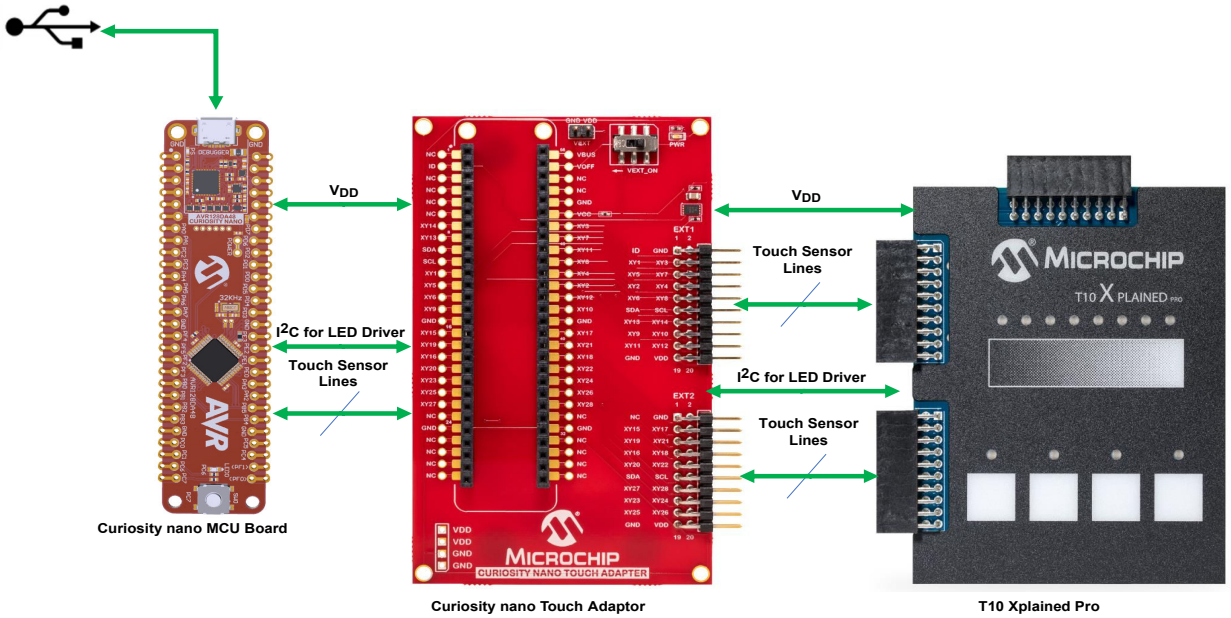
Introduction
The Curiosity Nano Touch Adapter Evaluation Kit is a motherboard which connects Curiosity Nano PIC®/AVR® MCU kits and Touch Extension kits such as: QT2, QT7, QT8, T10 and future extension kits of this type.

Figure 1-1. Curiosity Nano Touch Adapter Board



2. Curiosity Nano Touch Adapter Diagram

Figure 2-1. Functional Block Diagram



3. Getting Started

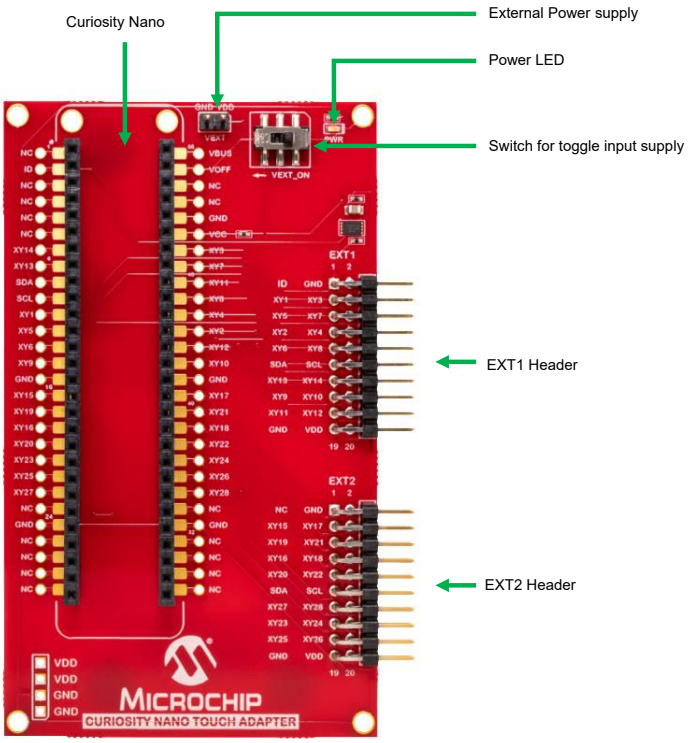
3.1 Quick Start

The following steps are neccessary to start exploring the Curiosity Nano platform:

1. Download Microchip MPLAB® X IDE/Atmel Studio.
2. Launch MPLAB® Code Configurator (MCC)/Atmel START.
3. Use code examples to configure the Curiosity Nano kit attached to the Curiosity Nano Touch Adapter, using MCC/Harmony 3/START.

The code examples are used as a base for the user's firmware development. First step how-to guides and all information on Microchip Touch are available at: https://microchipdeveloper.com/touch:start.

Figure 3-1. Quick Start



3.2 Documentation and Relevant Links

- Curiosity products: The next embedded design idea has a new home. Curiosity is a cost-effective, fully integrated 8-bit development platform targeted at first-time users, makers, and those seeking a feature-rich rapid prototyping board. Designed from the ground-up to take full advantage of Microchip's MPLAB X development environment, Curiosity includes an integrated programmer/debugger, and requires no additional hardware.
- Xplained products: Xplained evaluation kits are a series of easy-to-use evaluation kits for Microchip microcontrollers and other Microchip products.
  - Xplained Nano – used for low pin count devices that provides a minimalistic solution with access to all I/O pins of the target microcontroller.
  - Xplained Mini – used for medium pin count devices that adds an Arduino Uno compatible header footprint and a prototyping area.
  - Xplained Pro – used for medium-to-high pin count devices that feature advanced debugging and standardized extensions for peripheral functions.

Note: All the above kits have on-board programmers/debuggers, which creates a set of low-cost boards for evaluation and demonstration of features and capabilities of different Microchip products.

Software / IDE

- MPLAB® X IDE: MPLAB X IDE is a software program that runs on a PC (Windows®, Mac OS®, Linux®) to develop applications for Microchip microcontrollers and digital signal controllers. It is called an Integrated Development Environment (IDE) because it provides a single integrated “environment” to develop code for embedded microcontrollers.
- MPLAB® Code Configurator: MPLAB Code Configurator (MCC) is a free, graphical programming environment that generates seamless, easy-to-understand C code to be inserted into the project. Using an intuitive interface, it enables and configures a rich set of peripherals and functions specific to the application.
- MPLAB® Harmony v3: MPLAB® Harmony v3 is a fully integrated embedded software development framework that provides flexible and interoperable software modules that allow the users to dedicate their resources to creating applications for the 32-bit PIC® and SAM devices, rather than dealing with device details, complex protocols and library integration challenges. It works seamlessly with MPLAB X Integrated Development Environment (IDE) and the MPLAB® XC32 Compiler to enable a smooth transition and maximum code reuse between PIC32 MCUs, SAM MCUs and MPUs.
  MPLAB Harmony v3 has drivers, demo code, and Data Visualizer that supports data streaming and advanced debugging.
- Atmel Start: Atmel START is an online tool that helps the user to select and configure software components, and tailor the embedded application in a usable and optimized manner.
- Atmel Studio: Free IDE for the development of C/C++ and assembler code for microcontrollers.
- Data Visualizer: Data Visualizer is a program used for processing and visualizing data. The Data Visualizer can receive data from various sources such as the EDBG Data Gateway Interface found on Curiosity Nano, Xplained Pro boards and COM ports.
- Design documentation: The package containing CAD source, schematics, BOM, assembly drawings, 3D plots, layer plots, etc.
- Hardware user’s guide: The PDF version of this user’s guide.
- Curiosity Nano Touch Adapter: The kit webpage.
- Curiosity Nano Pin Configuration: The Curiosity Nano microcontroller and touch extension kits pin details.

Turnkey Touch Devkits

- CAP1188 Evaluation Kit: http://www.microchip.com/DevelopmentTools/ProductDetails/PartNo/dm160222
- CAP1298 Evaluation Kit: http://www.microchip.com/DevelopmentTools/ProductDetails/PartNo/dm160223
- MTCH108 Evaluation Board: http://www.microchip.com/DevelopmentTools/ProductDetails/PartNo/dm160229
- AT42QT1010 Evaluation Kit: https://www.microchip.com/developmenttools/ProductDetails/AC160219

4. Curiosity Nano

Curiosity Nano is an evaluation platform that provides a set of small boards with access to most of the microcontrollers I/Os. The platform consists of a series of low pin count microcontroller (PIC®/AVR® MCU) boards, which are integrated with Atmel Studio/Microchip MPLAB X to present relevant user guides, application notes, data sheets, and example codes. The platform features a Virtual COM port (CDC) for serial communication to a host PC and a Data Gateway Interface (DGI) GPIO.

Xplained Pro

The Xplained Pro is an evaluation platform that contains a series of microcontroller boards (evaluation kits) and extension boards. Atmel Studio/MPLAB X is used to program and debug the microcontrollers on these boards. Atmel Studio includes an Advanced Software Framework (ASF) and Atmel START/The Xplained Pro evaluation kits can be connected to a wide range of Xplained Pro extension boards through standardized headers and connectors. Xplained Pro extension boards have identification (ID) chips to uniquely identify which boards are connected to the Xplained Pro evaluation kits.

4.1 Hardware Identification System

All extension boards come with an identification CryptoAuthentication™ chip (ATSHA204A) to uniquely identify the boards that are connected to the microcontroller evaluation kit. This chip contains information that identifies the extension with its name, and some extra data. When an extension kit is connected to an microcontroller evaluation kit, the information is read and sent to Atmel Studio/MPLAB X. The following table shows the data fields stored in the chip ID with example content.

Table 4-1. Curiosity Nano Touch Adapter Chip ID Content

Data Field	Data Type	Example Content
Manufacturer	ASCII string	Microchip'\0'
Product name	ASCII string	Segment Curiosity Nano Adapter'\0'
Product revision	ASCII string	01'\0'
Product serial number	ASCII string	3338011800000001'\0'
Minimum voltage [mV]	uint16_t	3300
Maximum voltage [mV]	uint16_t	5000
Maximum current [mA]	uint16_t	45

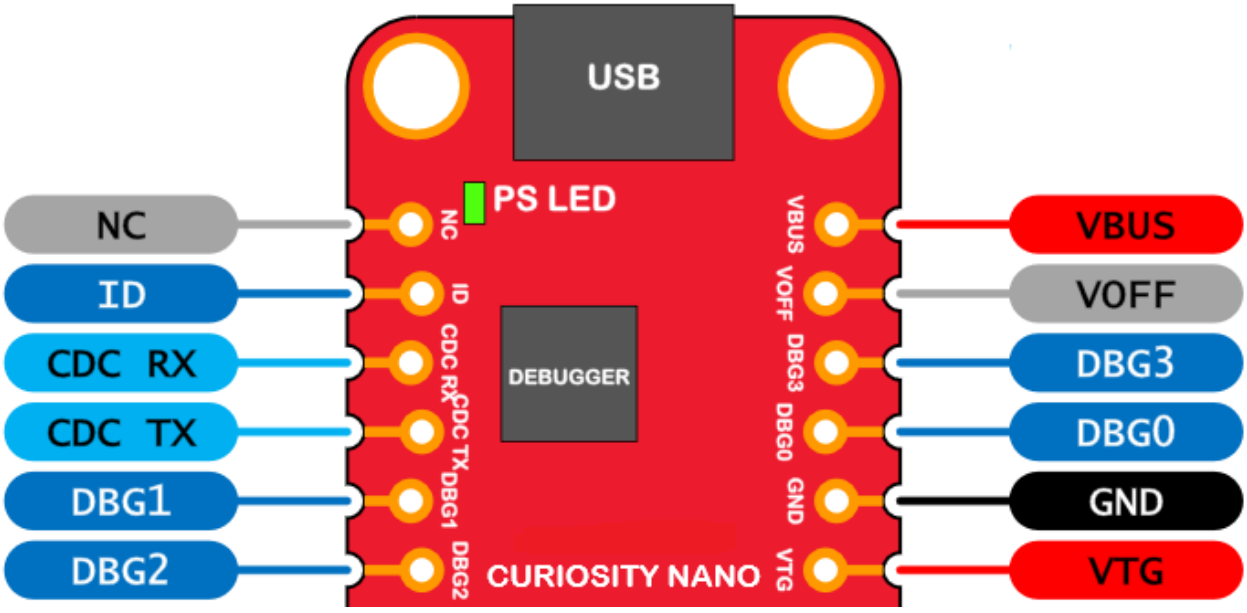
The twelve edge connections closest to the USB connector on Curiosity Nano kits have a standardized pinout. The program/debug pins have different functions depending on the target programming interface, as shown in Table 4-1 and Table 4-2.

Table 4-2. Curiosity Nano Standard Pinout

Debugger Signal	ICSP™ Target	Description
ID	-	ID line for extensions.
CDC TX	UART RX	USB CDC TX line.
CDC RX	UART TX	USB CDC RX line.
DBG0	ICSPDAT	Debug data line.
DBG1	ICSPCLK	Debug clock line/DGI GPIO.
DBG2	GPIO0	DGI GPIO.
DBG3	MCLR	Reset line.

.....continued		
Debugger Signal	**ICSP™ Target**	**Description**
NC	-	No connect.
V_{BUS}	-	VBUS voltage for external use.
V_{OFF}	-	Voltage Off input.
V_{TG}	-	Target voltage.
GND	-	Common ground.

Figure 4-1. Curiosity Nano Standard Pinout



5. Hardware User's Guide

5.1 Electrical Characteristics

The Curiosity Nano Touch Adapter can be connected to several Curiosity Nano Microcontroller (MCU) boards and manually connected to other hardware. The Curiosity Nano MCU board(s) that do not have 3.3V as the primary target voltage will read all ID devices on connected extensions to check if they support the target voltage before enabling it to the extension headers. The table below shows the static content written in the ID chip.

Table 5-1. Curiosity Nano Touch Adapter ID Chip Content

Data Field	Content
Product name	Curiosity Nano Touch Adapter
Minimum operation voltage	2.7V
Maximum operation voltage	5.5V
Maximum current	45 mA

See also 4.1 Hardware Identification System.

5.2 Curiosity Nano Touch Adapter Power Supply

The Curiosity Nano Touch Adapter is powered from the USB port on a connected Curiosity Nano microcontroller board. The USB voltage is used to supply the Xplained Pro extension header and the microcontroller on the Curiosity Nano microcontroller board. The power LED at the bottom edge of the board is lit whenever there is a voltage on the 3.3V line.

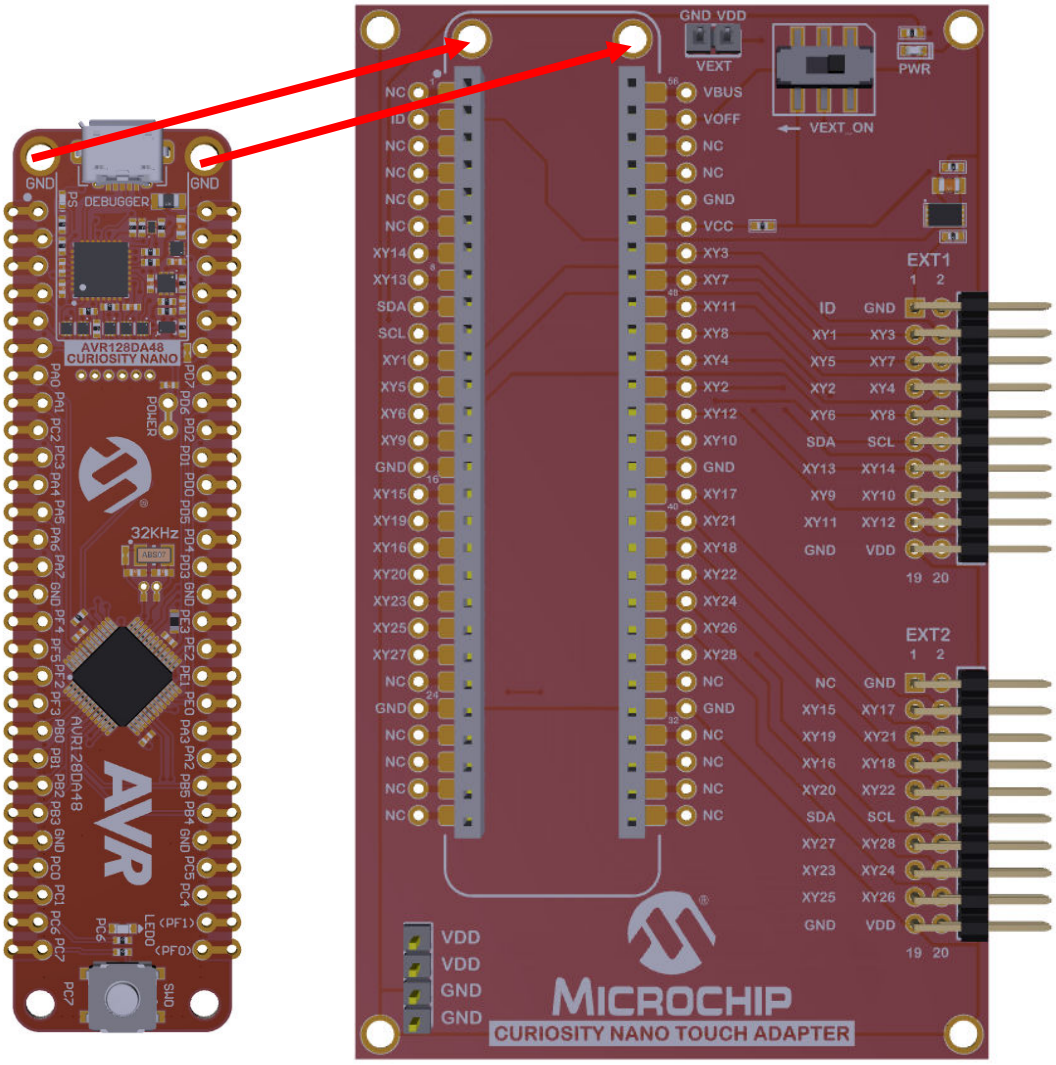
The external power can be supplied to the Curiosity Nano Touch Adapter to power the Curiosity Nano microcontroller board and the touch extension board through the VEXT header. The VOFF pin connected to the Curiosity Nano microcontroller board is pulled low by the Curiosity Nano Touch Adapter board using "SW1" switch. When VOFF is low, the power supply on the Curiosity Nano microcontroller board is disabled and the external power is supplied from the Curiosity Nano Touch Adapter board to the Curiosity Nano microcontroller and touch extension board.

5.3 Curiosity Nano Touch Adapter Mounting

Connecting a Curiosity Nano kit to the Curiosity Nano Touch Adapter board can be done in several ways. The most practical way is to insert the headers of the Curiosity Nano microcontroller board to the sockets of the Curiosity Nano Touch Adapter board. It is also possible to skip the header and socket, and solder the Curiosity Nano kit directly to the Curiosity Nano Touch Adapter board.

Aligning the USB connector on the Curiosity Nano kit with the upper edge of the Curiosity Nano Touch Adapter as shown in Figure 5-1 will connect the board correctly.

Figure 5-1. Curiosity Nano Touch Adapter Mounting



5.4 Headers and Connectors

5.4.1 Extension Headers

The Curiosity Nano Touch Adapter implements two Xplained Pro Standard Extension headers (see section Xplained Pro Standard Extension Header) marked with EXT1 and EXT2 in silkscreen. These headers make it possible to connect the Touch extension boards to the Curiosity Nano board with a capacitive touch-enabled microcontroller. The pinout definition for each extension header can be seen in Table 5-2 and Table 5-3.

Table 5-2. Curiosity Nano Touch Adapter Extension Header 1

Pin on EXT1	Function	Description
1	ID	Communication Line to ID Chip
2	GND	Ground
3	EXT1 XY1	Connected to Curiosity Nano Pin no. 11
4	EXT1 XY3	Connected to Curiosity Nano Pin no. 50

.....continued

Pin on EXT1	Function	Description
5	EXT1 XY5	Connected to Curiosity Nano Pin no. 12
6	EXT1 XY7	Connected to Curiosity Nano Pin no. 49
7	EXT1 XY2	Connected to Curiosity Nano Pin no. 45
8	EXT1 XY4	Connected to Curiosity Nano Pin no. 46
9	EXT1 XY6	Connected to Curiosity Nano Pin no. 13
10	EXT1 XY8	Connected to Curiosity Nano Pin no. 47
11	I2C_SDA	SDA for LED Driver connected to Curiosity Nano Pin no. 9
12	I2C_SCL	SDA for LED Driver connected to Curiosity Nano Pin no. 10
13	EXT1 XY13	Connected to Curiosity Nano Pin no. 8
14	EXT1 XY14	Connected to Curiosity Nano Pin no. 7
15	EXT1 XY9	Connected to Curiosity Nano Pin no. 14
16	EXT1 XY10	Connected to Curiosity Nano Pin no. 43
17	EXT1 XY11	Connected to Curiosity Nano Pin no. 48
18	EXT1 XY12	Connected to Curiosity Nano Pin no. 44
19	GND	Ground
20	V_{CC}	Target Supply Voltage

Table 5-3. Curiosity Nano Touch Adapter Extension Header 2

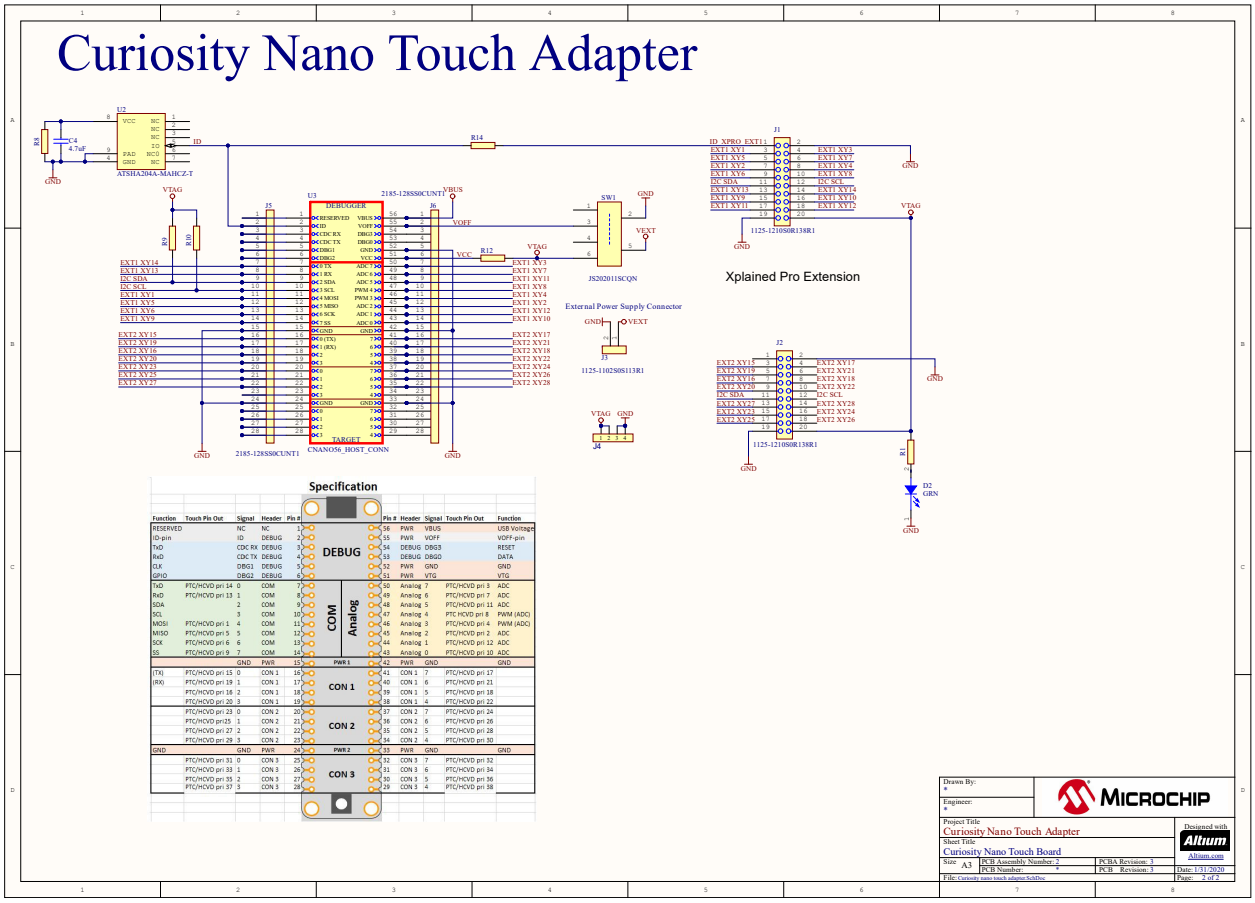
Pin on EXT2	Function	Description
1	ID	Communication Line to ID Chip
2	GND	Ground
3	EXT1 XY15	Connected to Curiosity Nano Pin no. 16
4	EXT1 XY17	Connected to Curiosity Nano Pin no. 41
5	EXT1 XY19	Connected to Curiosity Nano Pin no. 17
6	EXT1 XY21	Connected to Curiosity Nano Pin no. 40
7	EXT1 XY16	Connected to Curiosity Nano Pin no. 18
8	EXT1 XY18	Connected to Curiosity Nano Pin no. 39
9	EXT1 XY20	Connected to Curiosity Nano Pin no. 19
10	EXT1 XY22	Connected to Curiosity Nano Pin no. 38
11	I2C_SDA	SDA for LED Driver connected to Curiosity Nano Pin no. 9
12	I2C_SCL	SDA for LED Driver connected to Curiosity Nano Pin no. 10
13	EXT1 XY27	Connected to Curiosity Nano Pin no. 22
14	EXT1 XY28	Connected to Curiosity Nano Pin no. 35

.....continued

Pin on EXT2	Function	Description
15	EXT1 XY23	Connected to Curiosity Nano Pin no. 20
16	EXT1 XY24	Connected to Curiosity Nano Pin no. 37
17	EXT1 XY25	Connected to Curiosity Nano Pin no. 21
18	EXT1 XY26	Connected to Curiosity Nano Pin no. 36
19	GND	Ground
20	V_{CC}	Target Supply Voltage

6. Schematics

Figure 6-1. Curiosity Nano Touch Adapter Schematic



7. Hardware Revision History and Known Issues

7.1 Identifying Product ID and Revision

The revision and product identifier of the Curiosity Nano Touch Adapter can be found in two ways: either through Atmel Studio/Microchip MPLAB X IDE or on the sticker on the bottom side of the Printed Circuit Board (PCB).

By connecting a Curiosity Nano Touch Adapter to a PC with Atmel Studio/Microchip MPLAB X IDE running, an information window will pop up. The first six digits of the serial number, listed under kit details, contain the product and revision identifier.

The same information can be found on the sticker on the bottom side of the PCB. Most kits will print the product and revision identifier in plain text as A09-nnnn\rr, where “nnnn” is the identifier and “rr” is the revision. The boards with limited space have a sticker with only a QR-code, containing the product and revision identifier and the serial number.

The serial number string has the following format:

"nnnnrrssssssssss"

n = product identifier

r = revision

s = serial number

The product identifier for the Curiosity Nano Touch Adapter kit is A09-3342.

7.2 Revision 1

Revision 1 of the Curiosity Nano Touch Adapter (A09-3346/01) is the initial released version. There are no known issues.

8. Revision History

Document Revision	Date	Comments
A	03/2020	Initial document release.

The Microchip Website

Microchip provides online support via our website at http://www.microchip.com/. This website is used to make files and information easily available to customers. Some of the content available includes:

- **Product Support** – Data sheets and errata, application notes and sample programs, design resources, user's guides and hardware support documents, latest software releases and archived software
- **General Technical Support** – Frequently Asked Questions (FAQs), technical support requests, online discussion groups, Microchip design partner program member listing
- **Business of Microchip** – Product selector and ordering guides, latest Microchip press releases, listing of seminars and events, listings of Microchip sales offices, distributors and factory representatives

Product Change Notification Service

Microchip's product change notification service helps keep customers current on Microchip products. Subscribers will receive email notification whenever there are changes, updates, revisions or errata related to a specified product family or development tool of interest.

To register, go to http://www.microchip.com/pcn and follow the registration instructions.

Customer Support

Users of Microchip products can receive assistance through several channels:

- Distributor or Representative
- Local Sales Office
- Embedded Solutions Engineer (ESE)
- Technical Support

Customers should contact their distributor, representative or ESE for support. Local sales offices are also available to help customers. A listing of sales offices and locations is included in this document.

Technical support is available through the website at: http://www.microchip.com/support

Microchip Devices Code Protection Feature

Note the following details of the code protection feature on Microchip devices:

- Microchip products meet the specification contained in their particular Microchip Data Sheet.
- Microchip believes that its family of products is one of the most secure families of its kind on the market today, when used in the intended manner and under normal conditions.
- There are dishonest and possibly illegal methods used to breach the code protection feature. All of these methods, to our knowledge, require using the Microchip products in a manner outside the operating specifications contained in Microchip's Data Sheets. Most likely, the person doing so is engaged in theft of intellectual property.
- Microchip is willing to work with the customer who is concerned about the integrity of their code.
- Neither Microchip nor any other semiconductor manufacturer can guarantee the security of their code. Code protection does not mean that we are guaranteeing the product as "unbreakable."

Code protection is constantly evolving. We at Microchip are committed to continuously improving the code protection features of our products. Attempts to break Microchip's code protection feature may be a violation of the Digital Millennium Copyright Act. If such acts allow unauthorized access to your software or other copyrighted work, you may have a right to sue for relief under that Act.

Legal Notice

Information contained in this publication regarding device applications and the like is provided only for your convenience and may be superseded by updates. It is your responsibility to ensure that your application meets with

your specifications. MICROCHIP MAKES NO REPRESENTATIONS OR WARRANTIES OF ANY KIND WHETHER EXPRESS OR IMPLIED, WRITTEN OR ORAL, STATUTORY OR OTHERWISE, RELATED TO THE INFORMATION, INCLUDING BUT NOT LIMITED TO ITS CONDITION, QUALITY, PERFORMANCE, MERCHANTABILITY OR FITNESS FOR PURPOSE. Microchip disclaims all liability arising from this information and its use. Use of Microchip devices in life support and/or safety applications is entirely at the buyer's risk, and the buyer agrees to defend, indemnify and hold harmless Microchip from any and all damages, claims, suits, or expenses resulting from such use. No licenses are conveyed, implicitly or otherwise, under any Microchip intellectual property rights unless otherwise stated.

Trademarks

The Microchip name and logo, the Microchip logo, Adaptec, AnyRate, AVR, AVR logo, AVR Freaks, BesTime, BitCloud, chipKIT, chipKIT logo, CryptoMemory, CryptoRF, dsPIC, FlashFlex, flexPWR, HELDO, IGLOO, JukeBlox, KeeLoq, Kleer, LANCheck, LinkMD, maXStylus, maXTouch, MediaLB, megaAVR, Microsemi, Microsemi logo, MOST, MOST logo, MPLAB, OptoLyzer, PackeTime, PIC, picoPower, PICSTART, PIC32 logo, PolarFire, Prochip Designer, QTouch, SAM-BA, SenGenuity, SpyNIC, SST, SST Logo, SuperFlash, Symmetricom, SyncServer, Tachyon, TempTrackr, TimeSource, tinyAVR, UNI/O, Vectron, and XMEGA are registered trademarks of Microchip Technology Incorporated in the U.S.A. and other countries.

APT, ClockWorks, The Embedded Control Solutions Company, EtherSynch, FlashTec, Hyper Speed Control, HyperLight Load, IntelliMOS, Libero, motorBench, mTouch, Powermite 3, Precision Edge, ProASIC, ProASIC Plus, ProASIC Plus logo, Quiet-Wire, SmartFusion, SyncWorld, Temux, TimeCesium, TimeHub, TimePictra, TimeProvider, Vite, WinPath, and ZL are registered trademarks of Microchip Technology Incorporated in the U.S.A.

Adjacent Key Suppression, AKS, Analog-for-the-Digital Age, Any Capacitor, AnyIn, AnyOut, BlueSky, BodyCom, CodeGuard, CryptoAuthentication, CryptoAutomotive, CryptoCompanion, CryptoController, dsPICDEM, dsPICDEM.net, Dynamic Average Matching, DAM, ECAN, EtherGREEN, In-Circuit Serial Programming, ICSP, INICnet, Inter-Chip Connectivity, JitterBlocker, KleerNet, KleerNet logo, memBrain, Mindi, MiWi, MPASM, MPF, MPLAB Certified logo, MPLIB, MPLINK, MultiTRAK, NetDetach, Omniscient Code Generation, PICDEM, PICDEM.net, PICkit, PICtail, PowerSmart, PureSilicon, QMatrix, REAL ICE, Ripple Blocker, SAM-ICE, Serial Quad I/O, SMART-I.S., SQI, SuperSwitcher, SuperSwitcher II, Total Endurance, TSHARC, USBCheck, VariSense, ViewSpan, WiperLock, Wireless DNA, and ZENA are trademarks of Microchip Technology Incorporated in the U.S.A. and other countries.

SQTP is a service mark of Microchip Technology Incorporated in the U.S.A.

The Adaptec logo, Frequency on Demand, Silicon Storage Technology, and Symmcom are registered trademarks of Microchip Technology Inc. in other countries.

GestIC is a registered trademark of Microchip Technology Germany II GmbH & Co. KG, a subsidiary of Microchip Technology Inc., in other countries.

All other trademarks mentioned herein are property of their respective companies.

ISBN: 978-1-5224-5807-4

Quality Management System

For information regarding Microchip's Quality Management Systems, please visit http://www.microchip.com/quality.

Worldwide Sales and Service

AMERICAS	ASIA/PACIFIC	ASIA/PACIFIC	EUROPE
Corporate Office 2355 West Chandler Blvd. Chandler, AZ 85224-6199 Tel: 480-792-7200 Fax: 480-792-7277 Technical Support: http://www.microchip.com/support Web Address: http://www.microchip.com **Atlanta** Duluth, GA Tel: 678-957-9614 Fax: 678-957-1455 **Austin, TX** Tel: 512-257-3370 **Boston** Westborough, MA Tel: 774-760-0087 Fax: 774-760-0088 **Chicago** Itasca, IL Tel: 630-285-0071 Fax: 630-285-0075 **Dallas** Addison, TX Tel: 972-818-7423 Fax: 972-818-2924 **Detroit** Novi, MI Tel: 248-848-4000 **Houston, TX** Tel: 281-894-5983 **Indianapolis** Noblesville, IN Tel: 317-773-8323 Fax: 317-773-5453 Tel: 317-536-2380 **Los Angeles** Mission Viejo, CA Tel: 949-462-9523 Fax: 949-462-9608 Tel: 951-273-7800 **Raleigh, NC** Tel: 919-844-7510 **New York, NY** Tel: 631-435-6000 **San Jose, CA** Tel: 408-735-9110 Tel: 408-436-4270 **Canada - Toronto** Tel: 905-695-1980 Fax: 905-695-2078	**Australia - Sydney** Tel: 61-2-9868-6733 **China - Beijing** Tel: 86-10-8569-7000 **China - Chengdu** Tel: 86-28-8665-5511 **China - Chongqing** Tel: 86-23-8980-9588 **China - Dongguan** Tel: 86-769-8702-9880 **China - Guangzhou** Tel: 86-20-8755-8029 **China - Hangzhou** Tel: 86-571-8792-8115 **China - Hong Kong SAR** Tel: 852-2943-5100 **China - Nanjing** Tel: 86-25-8473-2460 **China - Qingdao** Tel: 86-532-8502-7355 **China - Shanghai** Tel: 86-21-3326-8000 **China - Shenyang** Tel: 86-24-2334-2829 **China - Shenzhen** Tel: 86-755-8864-2200 **China - Suzhou** Tel: 86-186-6233-1526 **China - Wuhan** Tel: 86-27-5980-5300 **China - Xian** Tel: 86-29-8833-7252 **China - Xiamen** Tel: 86-592-2388138 **China - Zhuhai** Tel: 86-756-3210040	**India - Bangalore** Tel: 91-80-3090-4444 **India - New Delhi** Tel: 91-11-4160-8631 **India - Pune** Tel: 91-20-4121-0141 **Japan - Osaka** Tel: 81-6-6152-7160 **Japan - Tokyo** Tel: 81-3-6880- 3770 **Korea - Daegu** Tel: 82-53-744-4301 **Korea - Seoul** Tel: 82-2-554-7200 **Malaysia - Kuala Lumpur** Tel: 60-3-7651-7906 **Malaysia - Penang** Tel: 60-4-227-8870 **Philippines - Manila** Tel: 63-2-634-9065 **Singapore** Tel: 65-6334-8870 **Taiwan - Hsin Chu** Tel: 886-3-577-8366 **Taiwan - Kaohsiung** Tel: 886-7-213-7830 **Taiwan - Taipei** Tel: 886-2-2508-8600 **Thailand - Bangkok** Tel: 66-2-694-1351 **Vietnam - Ho Chi Minh** Tel: 84-28-5448-2100	**Austria - Wels** Tel: 43-7242-2244-39 Fax: 43-7242-2244-393 **Denmark - Copenhagen** Tel: 45-4485-5910 Fax: 45-4485-2829 **Finland - Espoo** Tel: 358-9-4520-820 **France - Paris** Tel: 33-1-69-53-63-20 Fax: 33-1-69-30-90-79 **Germany - Garching** Tel: 49-8931-9700 **Germany - Haan** Tel: 49-2129-3766400 **Germany - Heilbronn** Tel: 49-7131-72400 **Germany - Karlsruhe** Tel: 49-721-625370 **Germany - Munich** Tel: 49-89-627-144-0 Fax: 49-89-627-144-44 **Germany - Rosenheim** Tel: 49-8031-354-560 **Israel - Ra'anana** Tel: 972-9-744-7705 **Italy - Milan** Tel: 39-0331-742611 Fax: 39-0331-466781 **Italy - Padova** Tel: 39-049-7625286 **Netherlands - Drunen** Tel: 31-416-690399 Fax: 31-416-690340 **Norway - Trondheim** Tel: 47-72884388 **Poland - Warsaw** Tel: 48-22-3325737 **Romania - Bucharest** Tel: 40-21-407-87-50 **Spain - Madrid** Tel: 34-91-708-08-90 Fax: 34-91-708-08-91 **Sweden - Gothenberg** Tel: 46-31-704-60-40 **Sweden - Stockholm** Tel: 46-8-5090-4654 **UK - Wokingham** Tel: 44-118-921-5800 Fax: 44-118-921-5820

X-ON Electronics

Largest Supplier of Electrical and Electronic Components

Click to view similar products for Sockets & Adapters ***category:***

Click to view products by Microchip ***manufacturer:***

Other Similar products are found below :

6508-0-00-01-00-00-33-0 AC164341 AC164348 1262 22827 AC164353 TDGL015 SA247 SM64TQ-ACTEL-1 70-0036 DS91230+ SMPA-ISP-ACTEL-3-KIT 16017 KIT 70601-3 SM132CQ-ACTEL IPC0181 IPC0175 IPC0165 AC164397 conga-Thin MITX/eDP to DP Adapter ML-ADP-EVN ASA.01 ASA.09 ASA.12 ASA.14 TOOLSTICK990MPP MIKROE-425 C305000ACP2 110-83-320-41-605101 110-83-632-41-605101 110-83-640-41-605101 110-83-628-41-605101 116-83-306-41-001101 PA0003 PA0007 PA0009 PA0035 PA0085 PA0096 IPC0079 ATARD-DBGADPT 80-000286 ATSTK600-RC88 ATSTK600-SC06 ATSTK600-RC78 SPC560PADPT64S AC164345 AC164342 14-351000-11-RC 966927-1