SAM D21
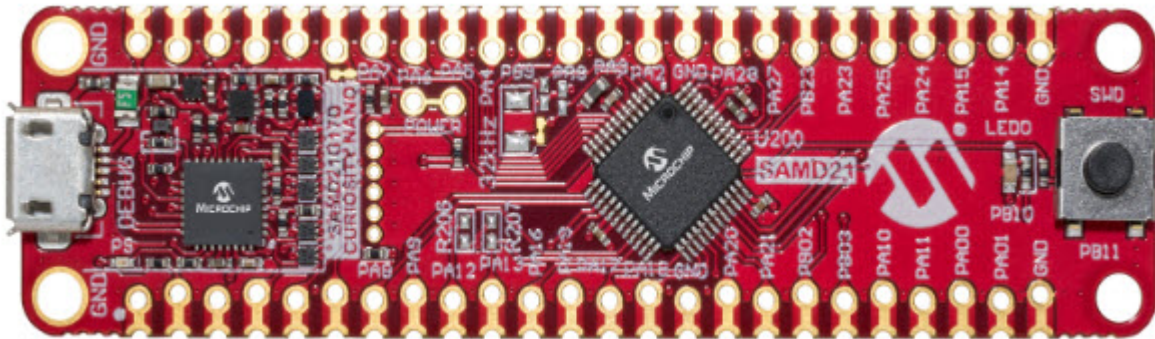
SAM D21 Curiosity Nano Evaluation Kit User's Guide

Preface

The SAM D21 Curiosity Nano Evaluation Kit (DM320119) is a hardware platform to evaluate the SAMD21G17D microcontroller (MCU), and it is supported by the MPLAB® X Integrated Development Environment (IDE). The evaluation kit provides an easy access to the features of the SAMD21G17D to integrate the device into a custom design. The Curiosity Nano series of evaluation kits include an On-Board Nano Debugger, hence external tools are not required to program the SAMD21G17D device. The SAM D21 Curiosity Nano Evaluation Kit is shown below.
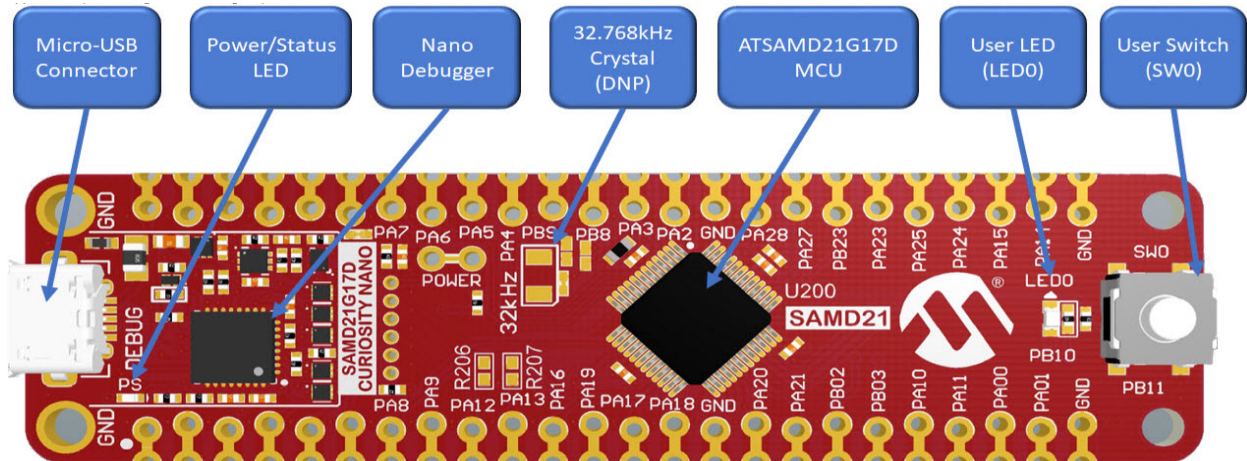
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1. Introduction

Kit Overview

The SAM D21 Curiosity Nano evaluation kit is a hardware platform used to evaluate the SAMD21G17D MCU.

Figure 1-1. Kit Overview

1.1 Features

The following are features of the SAM D21 Curiosity Nano evaluation kit:

- SAMD21G17D microcontroller
- One yellow user LED
- One mechanical user switch
- On-Board Nano Debugger
    - Board identification in MPLAB X IDE
    - One green power/status LED
    - Programing and debugging
    - Virtual COM port (CDC)
    - One logic analyzer (DGI GPIO)
- USB powered
- Adjustable target voltage
    - MIC5353 LDO regulator controlled by the On-Board Nano Debugger
    - 1.7V to 3.6V output voltage
    - 500 mA maximum output current (limited by ambient temperature and output voltage)

2. Getting Started

2.1 Curiosity Nano Quick Start

Follow these steps to explore the Curiosity Nano platform:

1. Download MPLAB X IDE.
2. Launch MPLAB X IDE.
3. Connect a USB cable (Standard-A to Micro-B or Micro-AB) between the PC and the debug USB port on the kit.

When the Curiosity Nano kit is connected to the computer for the first time, the operating system will perform a driver software installation. The driver file supports both 32-bit and 64-bit versions of Microsoft® Windows® XP, Windows Vista®, Windows 7, Windows 8, and Windows 10. The drivers for the kit are included with MPLAB X IDE.

After the Curiosity Nano board is powered, the green status LED will be lit and MPLAB X IDE will auto-detect which Curiosity Nano board is connected. MPLAB X IDE will populate relevant information like data sheets and kit documentation in the kit window. The SAMD21G17D device is programmed and debugged by the On-Board Nano Debugger, hence external programmer or debugger tool is not required.

3.   Curiosity Nano

Curiosity Nano is an evaluation platform that provides a set of small boards with access to most of the microcontroller I/Os. The platform consists of a series of low pin-count microcontroller (MCU) boards, which are integrated with MPLAB X IDE 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.

3.1   On-Board Nano Debugger

The SAM D21 Curiosity Nano contains an On-Board Nano Debugger for programming and debugging. The On-Board Nano Debugger is a complex USB device consists of several interfaces, such as a debugger, a mass storage device, a data gateway, and a Virtual COM port (CDC). Together with MPLAB X IDE, the On-Board Nano Debugger interface can program and debug SAMD21G17D. An DGI is available for use with the logic analyzer channels for code instrumentation to visualize program flow. DGI GPIOs can be graphed using the Data Visualizer. The Virtual COM port is connected to a UART on the SAMD21G17D and it provides an easy way to communicate with the target application through terminal software. The On-Board Nano Debugger controls one Power/Status LED (marked PS) on the SAM D21 Curiosity Nano evaluation board. The following table describes how the LED is controlled in different operation modes.

Table 3-1. On-Board Nano Debugger LED Control

Operation Mode	Status LED
Boot Loader mode	LED blink at 1 Hz during power up.
Power-up	LED is lit, constant.
Normal operation	LED is lit, constant.
Programming	Activity indicator, the LED flashes slowly during programming or debugging.
Fault	The LED flashes fast if a power fault is detected.
Sleep/Off	LED is OFF. The On-Board Nano Debugger is either in Sleep mode or Power-Down mode. This will occur only if the kit is externally powered

3.1.1   Virtual COM Port

A general-purpose USB serial bridge between a host PC and a target device.

3.1.1.1   Overview

The debugger implements a complex USB device that includes a standard Communications Device Class (CDC) interface, which appears on the host as a Virtual COM Port. The CDC can be used to stream arbitrary data in both directions between the host and the target. Characters sent from the host will appear in UART form on the CDC TX pin, and UART characters sent into the CDC RX pin will be sent back to the host. On Windows machines, the CDC will enumerate as the Curiosity Virtual COM Port and appear in the ports section of the device manager. The COM port number is usually shown here.

Note: On the older version of Windows systems a USB driver is required for CDC. This driver is included in Atmel® Studio and MPLAB X IDE installations. On Linux machines, the CDC will enumerate and appear as `/dev/ttyACM#`. On MAC machines, the CDC will enumerate and appear as `/dev/tty.usbmodem#`. Depending on which terminal program is used, it will appear in the available list of modems as `usbmodem#`.

3.1.1.2   Limitations

Not all UART features are implemented in the debugger CDC, and the constraints are outlined below:

- Baud rate: Must be in the range of 1200 bps to 500 kbps. Values outside this range will be capped to these values, without warning. Baud rate can be changed on-the-fly.
- Character format: Only 8-bit characters are supported.
- Parity: Can be odd, even, or none.
- Hardware flow control: Not supported.

- Stop bits: One or two bits are supported.

3.1.1.3 Signaling

During USB enumeration, the host OS will start both communication and data pipes of the CDC interface. At this point, it is possible to set and read baud rate and other UART parameters of the CDC, but data sending and receiving will not be enabled. When a terminal connects on the host, it must assert the DTR signal. This is a virtual control signal that is implemented on the USB interface but not in hardware on the debugger. Asserting DTR from the host will indicate to the debugger that a CDC session is active, and it will enable its level shifters (if available), and start the CDC data send and receive mechanisms. Deasserting the DTR signal will not disable the level shifters, but it will disable the receiver, hence no further data will be streamed to the host. Data packets that are already queued up for sending to the target will continue to be sent out, but no further data will be accepted.

3.1.1.4 Advanced Use

When the CDC Override mode is in normal operation, the On-Board Nano Debugger is a true UART bridge between the host and the device. However, under certain use cases, the debugger can override the Basic Operating mode and use the CDC pins for other purposes. Dropping a text file (with extension `.txt`) into the debugger's mass storage drive can be used to send characters out of the CDC TX pin. The text file must start with the characters: `CMD:SEND_UART=`. The maximum message length is 50 characters, and all remaining data in the frame is ignored. The default baud rate used in this mode is 9600 bps, but if the CDC is already active or has been configured, the recently used baud rate still applies.

USB-Level Framing Considerations

Sending data from the host to the CDC can be done byte-wise or in blocks, which will be chunked into 64-byte USB frames. Each frame will be queued up for sending to the CDC TX pin. Sending a small amount of data per frame can be inefficient, particularly at low-baud rates, because the debugger buffers frames, not bytes. A maximum of 4 x 64-byte frames can be active at any time, the debugger will throttle the incoming frames accordingly. Sending full 64-byte frames containing data is the most efficient. When receiving data from the target, the debugger will queue up incoming bytes into 64-byte frames, which are sent to the USB queue for transmission to the host when they are full. Incomplete frames are also pushed to the USB queue at approximately 100 ms intervals, triggered by USB start-of-frame tokens. Up to 8 x 64-byte frames can be active at any time. If the host or software running on it, fails to receive data fast enough, an overrun will occur. When this happens the last-filled buffer frame will be recycled instead of being sent to the USB queue, and a full frame of data will be lost. To prevent this occurrence, the user must ensure that the CDC data pipe is being read continuously, or the incoming data rate must be reduced.

Note: Mass storage disk is not supported during this release.

3.1.2 Mass Storage Disk

Not supported at this time.

3.2 Curiosity Nano Standard Pinout

The twelve edge connections closest to the USB connector on Curiosity Nano kits have a standardized pinout. The program and debug pins have different functions depending on the target programming interface as shown in the following table and figure.

Table 3-2. Curiosity Nano Standard Pinout

Debugger Signal	ICSP Target	Description
NC	-	No connect.
ID	-	ID line for extensions.
CDC RX	UART TX	USB CDC RX line.
CDC TX	UART RX	USB CDC TX line.
DBG1	SWCLK	Debug clock line
DBG2	GPIO	DGI GPIO

	Debugger Signal	ICSP Target	Description
..........continued			
	VTG	-	Target voltage
	GND	-	Common ground.
	DBG0	SWDATA	Debug data line.
	DBG3	nRESET	Reset line
	VOFF	-	Voltage Off input.
	VBUS	-	VBUS voltage for external use.

Figure 3-1. Curiosity Nano Standard Pinout
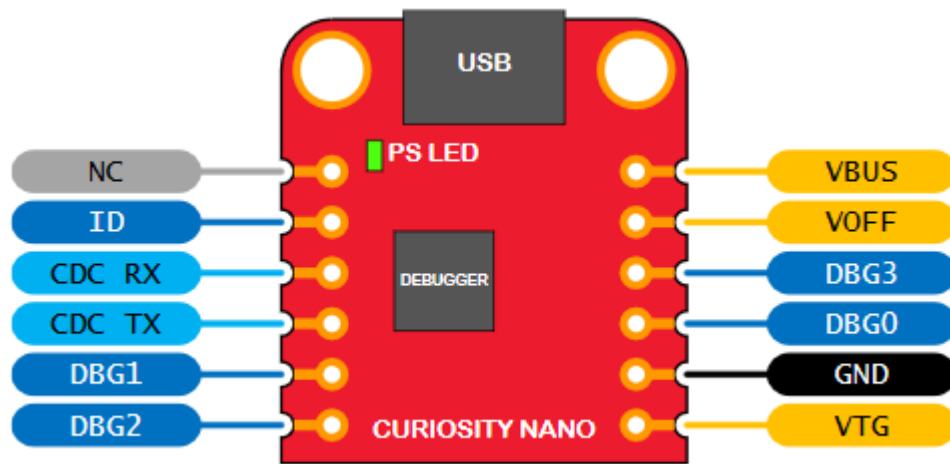
3.3 Power Supply

The evaluation kit is powered through the USB port and contains two regulators for generating 3.3V for the debugger and an adjustable regulator for the target. The voltage from the USB connector can vary between 4.4V-5.25V (according to the USB specification) and will limit the maximum voltage to the target. The following figure shows the entire power supply system on the SAM D21 Curiosity Nano.

Figure 3-2. Power Supply Block Diagram
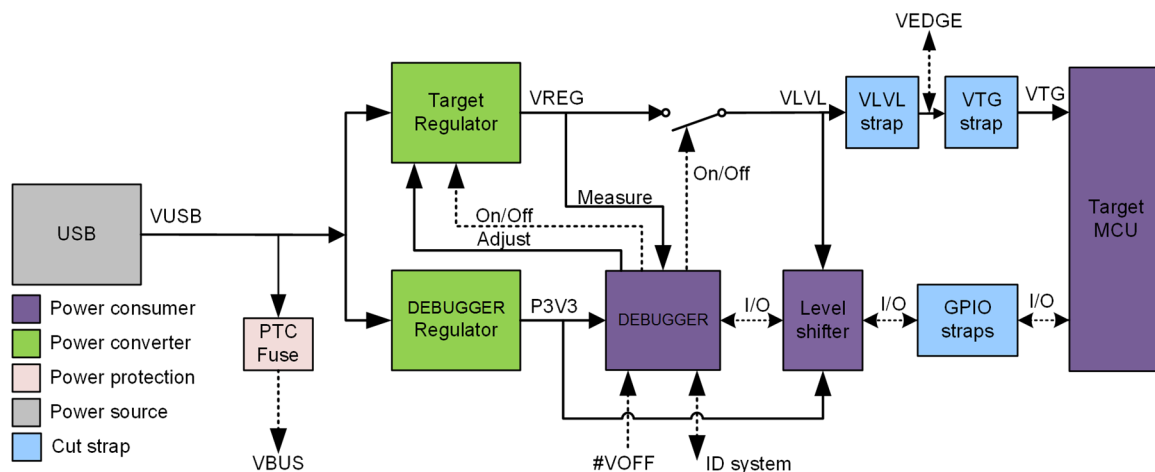
3.3.1 Target Voltage Regulator

The target voltage regulator is a MIC5353 variable output LDO. The On-Board Nano Debugger can adjust the voltage output that is supplied to the kit target section by manipulating the MIC5353's feedback voltage. The hardware implementation is limited to an approximate voltage range from 1.7V-5.1V. Additional output voltage limits are configured in the debugger firmware to ensure that the output voltage never exceeds the hardware limits of the SAMD21G17D microcontroller. The voltage limits configured in the On-Board Nano Debugger on the SAM D21 Curiosity Nano are 1.7V-3.6 V. The target voltage is set to 3.3V in production and can be changed through Atmel Studio. Any change to the target voltage done in Atmel Studio is persistent, even through a power toggle. The MIC5353 supports a maximum current load of 500 mA. It is an LDO regulator in a small package, placed on a small PCB, and the thermal shutdown condition can be reached at lower loads than 500 mA. The maximum current load depends on the input voltage, set output voltage, and the ambient temperature. The following figure shows the safe operation area for the regulator with an input voltage of 5.1V and an ambient temperature of 23°C.

Figure 3-3. Target Regulator Safe Operation Area
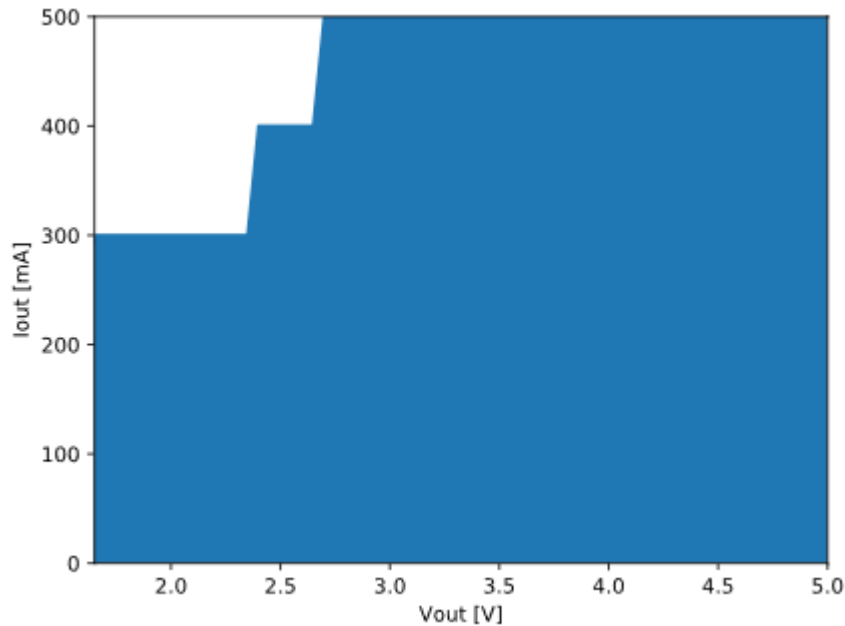
3.3.2 External Supply

The SAM D21 Curiosity Nano evaluation kit can be powered by an external voltage instead of the on-board target regulator. When the Voltage Off (VOFF) pin is shorted to ground (GND), the On-Board Nano Debugger firmware disables the target regulator and it is safe to apply an external voltage to the VTG pin.

⚠️**WARNING** Applying an external voltage to the VTG pin without shorting VOFF to GND may cause permanent damage to the kit.

⚠️**WARNING** Absolute maximum external voltage is 5.5V for the level shifters on board. Applying a higher voltage may cause permanent damage to the kit.

Programming, debugging, and data streaming are still possible while using the external power. The debugger and signal level shifters will be powered from the USB cable. Both regulators, the debugger, and the level shifters are powered down when the USB cable is removed.

3.4 Disconnecting the On-Board Nano Debugger

The following block diagram shows connections between the debugger and the SAMD21G17D microcontroller. The round boxes represent connections to the board edge on the SAM D21 Curiosity Nano. The signal names are shown in Figure 3-1 and printed in silkscreen on the bottom side of the board.

Figure 3-4. On-Board Nano Debugger Connections
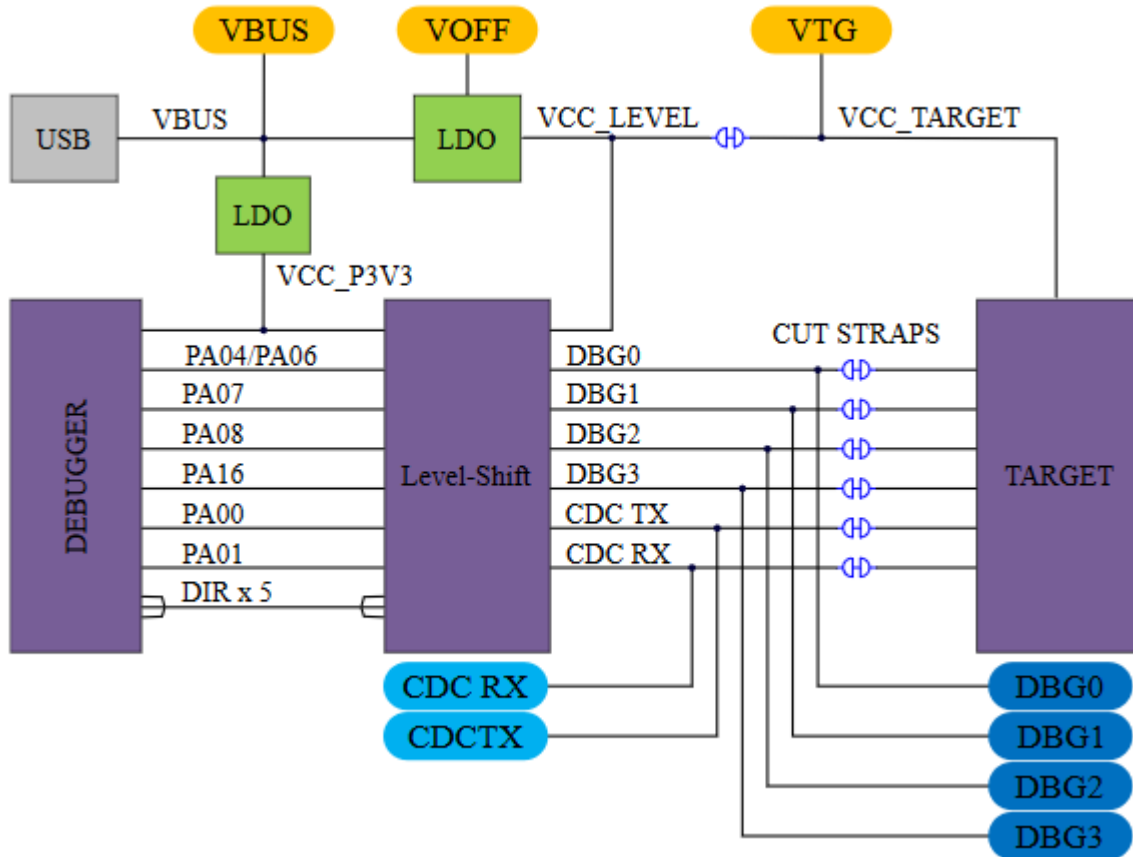
By cutting the GPIO straps with a sharp tool, as shown in the following figure, all I/Os connected between the debugger and the SAMD21G17D can be disconnected. To disconnect the target regulator, cut the VTG strap.

Notes:
1. Cutting the connections to the debugger will disable programming, debugging, data streaming, and the target power supply. The signals will also be disconnected from the board edge next to the On-Board Nano Debugger section.
2. Solder in 0Ω resistors across the footprints or short-circuit them with tin solder to reconnect any cut signals.
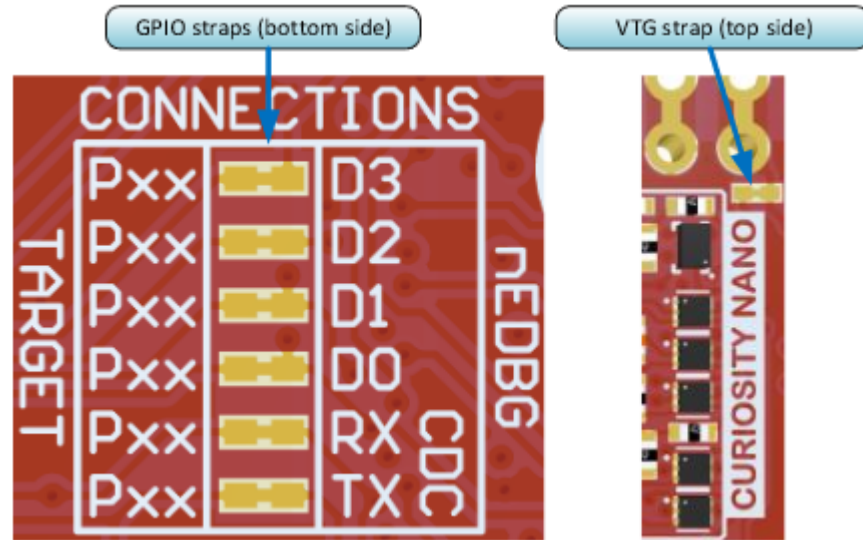
3.5 Current Measurement

The power to the SAMD21G17D is connected from the on-board power supply to the target voltage supply (VTG) with a cut strap as shown in Disconnecting the On-Board Debugger. To measure the power consumption of the SAMD21G17D and other peripherals connected to the board, cut the strap and connect an ammeter over the strap. The ammeter can be connected between the target VTG pad edge connector and an external power supply for easy measurement. Alternatively, an external power supply can be used as described in External Supply.

> **Tip:** The on-board level shifters will draw a small amount of current even when they are not in use. Disconnect the On-Board Nano Debugger and level shifters as described in Disconnecting the On-Board Debugger to prevent any current leakage.

4. Hardware

4.1 Connectors

4.1.1 SAM D21 Curiosity Nano Pinout

All of the SAM D21G17D I/O pins are accessible at the edge connectors on the SAM D21 Curiosity Nano, except the button and LED (PB10, PB11). The following figure shows the evaluation kit pinout. RA30 and RA31 are only available at the edge connector in the debugger section as long as the cut straps on the bottom are not cut.
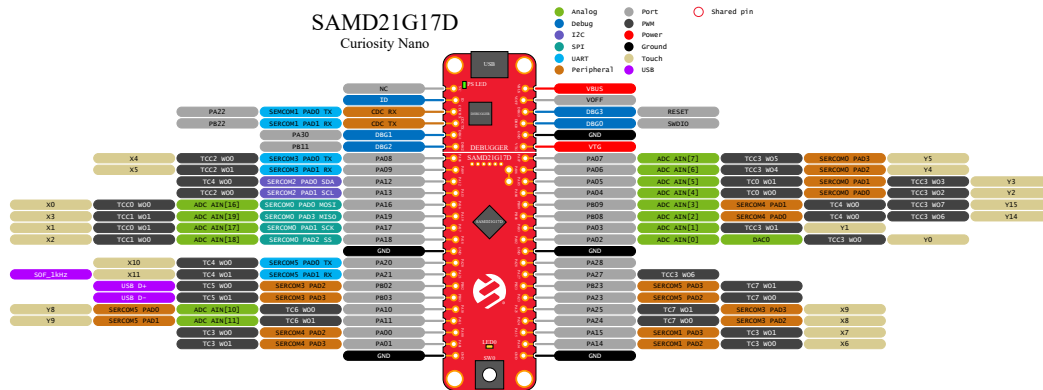
Note: Not all pin functions are listed in the diagram. Additional functions are available on these pins, for a list of additional functions, refer to the data sheet available at www.microchip.com.

4.1.2 SAM D21 Curiosity Nano Base Quick Reference

The SAM D21G17D is compatible with the Curiosity Nano Base for click boards™ (AC164162). The following figure shows a simplified reference to enable quicker development.

For additional information, visit https://www.microchip.com/developmenttools/ProductDetails/AC164162.

SAMD21G17D
Curiosity Nano
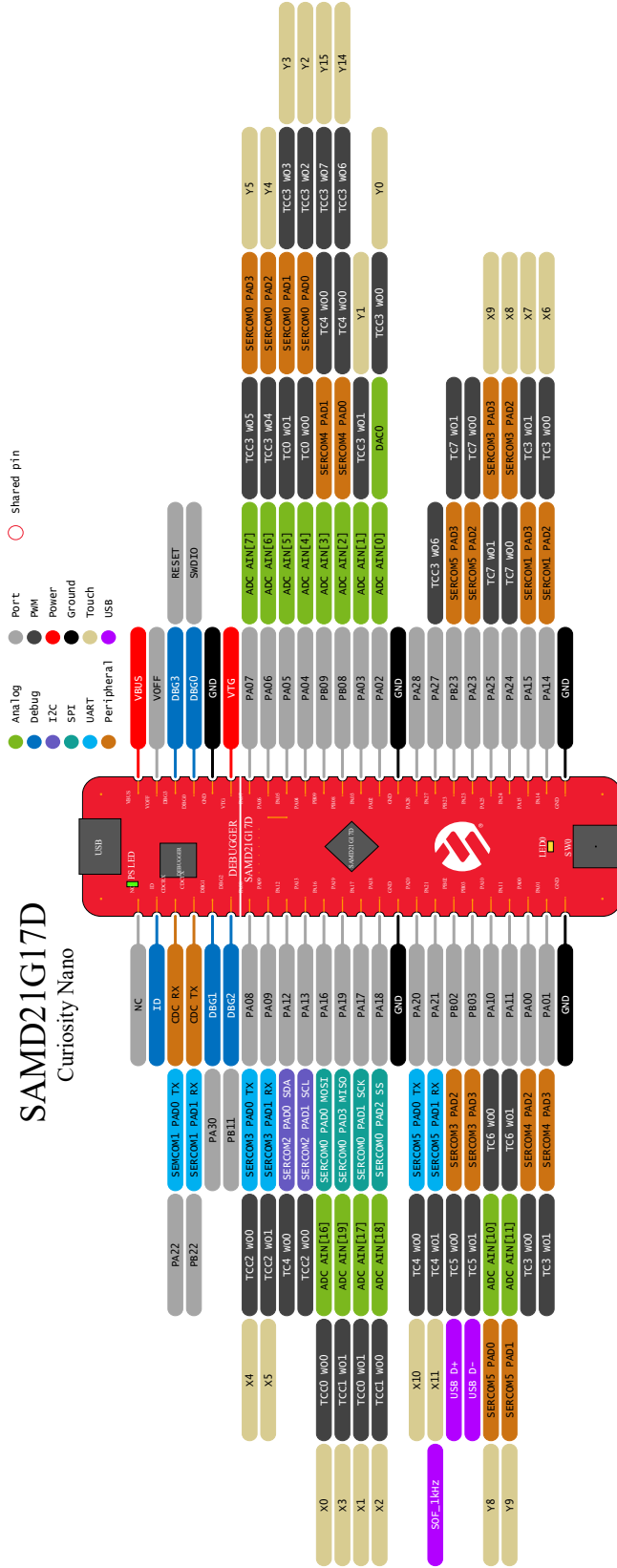
Curiosity Nano Base for click boards ™
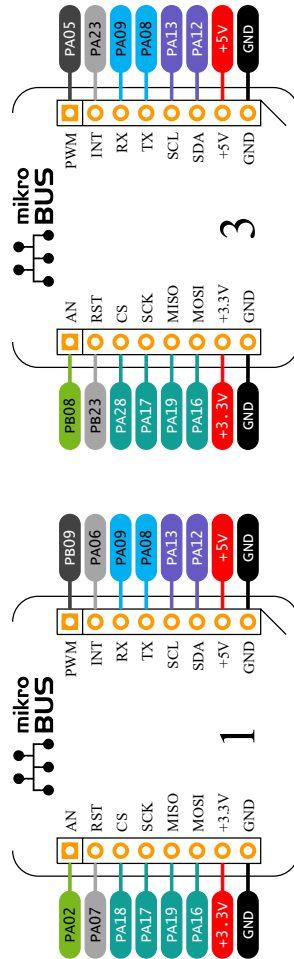
Xplained Pro Extension
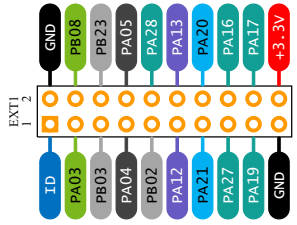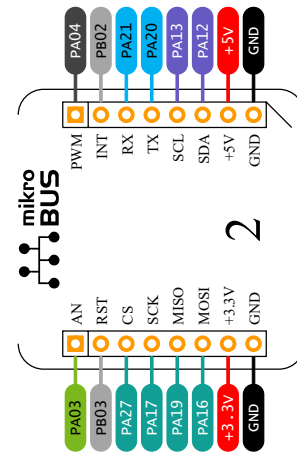
4.2   Peripherals

4.2.1   LED

One yellow LED is available on the SAM D21 Curiosity Nano evaluation kit, which can be controlled either with a GPIO or PWM. The LED can be activated by driving the connected I/O line to the GND.

Table 4-1. LED Connection

SAMD21G17D	Function	Shared Functionality
PB10	Yellow LED0	None

4.2.2   Mechanical Switch

The SAM D21 Curiosity Nano has one mechanical switch, a generic user configurable switch. When this switch is pressed, it will drive the I/O line to ground (GND).

Note: No pull-up resistor is connected to the generic user switch. Ensure that the internal pull-up is enabled in the SAMD21G17D to use the switch.

Table 4-2. Mechanical Switch

SAMD21G17D	Function	Shared Functionality
PB11	User switch SW0	DBG2 and Edge connector

4.2.3   Crystal

The SAM D21 Curiosity Nano board has the option for a 32.768 kHz crystal, and by default this crystal is not connected to the SAMD21G17D, as GPIOs are routed out to the edge connector. To use the crystal, some hardware modifications are required. The two I/O lines routed to the edge connector must be disconnected to reduce the chance of contention to the crystal, and to remove excessive capacitance on the lines.

Table 4-3. Crystal Connections

SAMD21G17D pin	Function	Shared Functionality
PA00	XIN32	Edge connector
PA01	XOUT32	Edge connector

4.3   On-Board Nano Debugger Implementation

The SAM D21 Curiosity Nano features an On-Board Nano Debugger that can be used to program and debug the SAMD21G17D using a Serial wire debug (SWD). The On-Board Nano Debugger also includes a Virtual Com port interface over UART and DGI GPIO. MPLAB X IDE can be used as a front-end for the On-Board Nano Debugger for programming and debugging. Data Visualizer can be used as a front-end for the CDC and DGI GPIO.

4.3.1   On-Board Nano Debugger Connections

The following table provides the connection details between the target and the debugger section. All connections between the target and the debugger are tri-stated as long as the debugger is not actively using the interface, therefore little contamination of the signals and the pins can be configured to the application requirements. For additional information on how to use the capabilities of the On-Board Nano Debugger, see Curiosity Nano.

Table 4-4. Connection Details between the Target and Debugger Section

SAMD21G17D pin	Debugger pin	Function	Shared Functionality
PB22	CDC TX	UART TX (SAMD21G17D RX line)	Edge Connector
PA22	CDC RX	UART RX (SAMD21G17D TX line	Edge Connector

SAMD21G17D pin	Debugger pin	Function	Shared Functionality
..........continued			
PA31	DBG0	SWDATA	Edge Connector
PA30	DBG1	SWCLK	Edge Connector
PB11	DBG2	GPIO	Edge Connector and SW0
nRESET	DBG3	nRESET	Edge Connector
VCC_TARGET	VCC_LEVEL	1.7V-3.6V supply voltage	Edge Connector
GND	GND	Common ground	Edge Connector

5. Hardware Revision History

This user guide provides the latest available revision of the kit. This chapter contains information about known issues, a revision history of older revisions, and how older revisions differ from the latest revision.

5.1 Identifying Product ID and Revision

The revision and product identifier of Curiosity Nano boards can be found in two ways; either through the MPLAB X IDE or by looking at the sticker on the bottom of the PCB. By connecting a Curiosity Nano board to a computer with MPLAB X IDE running, an information window will pop up. The first six digits of the serial number, which is listed under kit details, contain the product identifier and revision. The same information can be found on the sticker on the bottom of the PCB. Most kits will print the identifier and revision in plain text as A09-nnnn\rr, where nnnn is the identifier and rr is the revision. Boards with limited space have a sticker with only a QR-code, which contains a serial number string. The serial number string has the following format:

"nnnnrrssssssssss"

n = product identifier

r = revision

s = serial number

6. Schematics

Figure 6-1. Target Microcontroller (SAMD21G17D)

Figure 6-2. Debugger

SAMD21 (Target Device)

VCC_TARGET
C207 100n
GND
C208 1u

SAMD21G17D-AUT
U200

PA00 XIN32
PA01 XOUT32
PA02 ADC0
PA03 ADC1
GNDANA
PB08 ADC2
PB09 PWM3
PA04 PWM4
PA05 ADC5
PA06 ADC6
PA07 ADC7

VDDIO
GND
USB_DP/PA25
USB_DM/PA24
USB_SOF/PA23
PA22 CDC5 TX
PA21 UART3 RX
PA20 UART3 TX
PA19 SPI MISO
PA18 SPI SS
PA17 SPI SCK
PA16 SPI MOSI

VCC_TARGET
C206 100n
GND

PA25
PA24
PA23

GND
C201 100n
L200
BLM18PG471SN1
VCC_TARGET

PA08 UART0 TX
PA09 UART0 RX
PA10 UART2 TX
PA11 UART2 RX
PB10 LED
PB11 BUTTON
PA12 I2C4 SDA
PA13 I2C4 SCL
PA14
PA15

VCC_TARGET
C202 100n
GND

DEBUGGER CONNECTIONS

CDC_UART UART RX TX
DBG0
DBG3
DBG1
DBG2
VOFF
ID_SYS

PROG/DEBUG Pull

VCC_TARGET
R204 47k DBG0
R205 47k DBG1

nRESET Pull
VCC_TARGET
R200 10k

J200
DEBUGGER
TARGET
CNANO48-pin edge connector

NOTE on CDC:
TX and RX cross here.

NOTE on UART/CDC:
RX/TX on the header denotes the input/output direction of the signal respective to it's source.

CDC TX is output from the DEBUGGER.
CDC RX is input to the DEBUGGER.
TX is output from the TARGET device.
RX is input to the TARGET device.

USER BUTTON
R202 1k
SW0
TS604VM1-035CR

USER LED
VCC_TARGET
D200
YELLOW LED
SML-D12Y1WT86
R203 110R
GND

TARGET BULK
VCC_EDGE
C205 2.2uF
GND

32kHz Crystal
XC200
J209
C203 10pF
C204 13pF
GND
32.768kHz
Kyocera Corporation
ST3215SB32768C0HPWBB

Crystal datasheet:
Ccrystal = 7pF
max ESR = 70kOhm
Accuracy ±20ppm

SAMD21 datasheet:
Cxin = 5.5pF
Cxout = 5.5pF
Cl ≈ 1/((1/5.5pF)+ (1/5.5pF)) ≈ 2.75pF
Maximum Load = 12.5pF
Maximum ESR = 80kOhm

Estimated Cpcb = 0.5pF

Estimated load
C = 2 (Ccrystal- Cpara - Cpcb)
C = 2 (7pF - 2.75pF - 0.5pF)
C = 7.5pF

Selected in design after verification
C= 10/13pF

VCC_TARGET
R206 R207
PA12 I2C4 SDA
PA13 I2C4 SCL

Figure 6-3. Debugger

TARGET ADJUSTABLE REGULATOR

VCC_VBUS

U102 MIC5353
VIN VOUT
EN NC/ADJ
BYP GND GND

VCC_REGULATOR

U108 MIC94163
VIN VOUT
VIN VOUT
EN GND

VCC_LEVEL VCC_EDGE

J100

J101

VCC_TARGET

REG_ENABLE

R109 47k
R100 47k
R103 47k
C102 100n
R101 47k
R104 27k
R105 47k
C103 2.2uF
R102 47k
R111 47k

VBUS_ADC
GND
GND
GND
REG_ADJUST
GND
GND
VTG_EN
GND
GND

R106 33k

VTG_ADC
DAC

Adjustable output and limitations:
- The debugger can adjust the output voltage of the regulator between 1.25V and 5.1V to the target.
- The level shifters have a minimal voltage level of 1.65V and will limit the minimum operating voltage allowed for the target to still allow communication.
- The output switch has a minimal voltage level of 1.70V and will limit the minimum voltage delivered to the target.
- Firmware configuration will limit the voltage range to be within the the target specification.
- Firmware feedback loop will adjust the output voltage accuracy to within 0.5%.

J100:
- Cut-strap used for full separation of target power from the level shifters and on-board regulators.
- For current measurements using the on-board power supply, this strap must be cut and an ammeter connected across.
- For current measurements using an external power supply, this strap could be cut for more accurate measurements. Leakage back through the switch is in the micro ampere range.

MIC5353:
Vin: 2.6V to 6V
Vout: 1.25V to 5.1V
Imax: 500mA
Dropout (typical): 50mV@150mA, 160mV @ 500mA
Accuracy: 2% initial
Thermal shutdown and current limit

Maximum output voltage is limited by the input voltage and the dropout voltage in the regulator.
(Vmax = Vin - dropout)

Interface Signal	SWD TARGET
CDC TX	UART RX
CDC RX	UART TX
DBG0	SWDAT
DBG1	SWCLK
DBG2	GPIO
DBG3	nRESET
VCC	3.3V

MIC5528:
Vin: 2.5V to 5.5V
Vout: Fixed 3.3V
Imax: 500mA
Dropout: 260mV @ 500mA

DEBUGGER TESTPOINT

SWCLK
SWDIO
Vsup

J102
TCK GND
TDO VTref
TMS SRST
Vsup TRST
TDI GND

GND
VCC_P3V3
SRST

Programming connector for factory programming of Debugger.

Testpoint Array

DEBUGGER REGULATOR

VCC_VBUS U101 MIC5528-3.3YMT VCC_P3V3
VIN VOUT
EN VOUT
GND
EP NC
C100 4.7uF
C101 2.2uF
GND
GND
GND

DEBUGGER POWER/STATUS LED

VCC_MCU_CORE GND
C106 1u
GND
C107 100n
VCC_P3V3
SWCLK
SWDIO

STATUS_LED

R107 1k
D100
GREEN LED
SML-P12MTT86R
VCC_P3V3

DEBUGGER USB MICRO-B CONNECTOR

VBUS VCC_VBUS
F100 MC36213
PTC Resettable fuse:
Hold current: 500mA
Trip current: 1000mA

J105
1 VBUS
2 D-
3 D+
4 ID
5 GND
6 SHIELD1
7 SHIELD2
8 SHIELD3
9 SHIELD4

USBD_N
USBD_P
GND
L100 BLM15PD800SN1
SHIELD
MU-MB0142AB2-269

ID PIN

VCC_P3V3
R112 1k
ID_SYS
ID_SYS

U103 74LVC1T45FW4-7
CDC_TX_CTRL VCC_LEVEL
VCCB VCCA
DIR GND
B A
VCC_P3V3
GND

CDC_UART UART TX RX

U104 74LVC1T45FW4-7
CDC_RX_CTRL VCC_LEVEL
VCCB VCCA
DIR GND
B A
VCC_P3V3
GND

CDC_TX
CDC_RX

U105 74LVC1T45FW4-7
DBG0_CTRL VCC_LEVEL
VCCB VCCA
DIR GND
B A
VCC_P3V3
GND

DBG0
R108 1k

U106 74LVC1T45FW4-7
DBG1_CTRL VCC_LEVEL
VCCB VCCA
DIR GND
B A
VCC_P3V3
GND

DBG1

U107 74LVC1T45FW4-7
DBG2_CTRL VCC_LEVEL
VCCB VCCA
DIR GND
B A
VCC_P3V3
GND

DBG2

U100 SAMD21E18A-MUT

SWDIO/PA31
SWDCLK/PA30
VDD1N
VDDCORE
PA29
RESETN
PA28
PA27

PA00
PA01
PA02
PA03
PA04
PA05
PA06
PA07
PA08
PA09
PA10
PA11
PA14
PA15

USBD_DP/PA25
USBD_DM/PA24
USB_SOF/PA23
PA22
PA19
PA18
PA17
PA16
PAD

S1_0_TX
S1_1_RX
DAC
VTG_ADC
S0_0_RX
RESERVED
S0_2_TX
S0_3_CLK

USBD_P
USBD_N
ID_SYS
CDC_TX_CTRL
VOFF
CDC_RX_CTRL
VTG_EN
DBG3_CTRL

VCC_P3V3
C108 100n
GND

TP100 TP101
BOOT
SRST
GND

GND

DBG2_CTRL
DBG2_GPIO
REG_ENABLE
VBUS_ADC
DBG0_CTRL
DBG1_CTRL

GND

DBG3 OPEN DRAIN

R110 1k
Q101 DMN65D8LFB
R113 10k
DBG3
DBG3_CTRL
GND
GND

VOFF VOFF
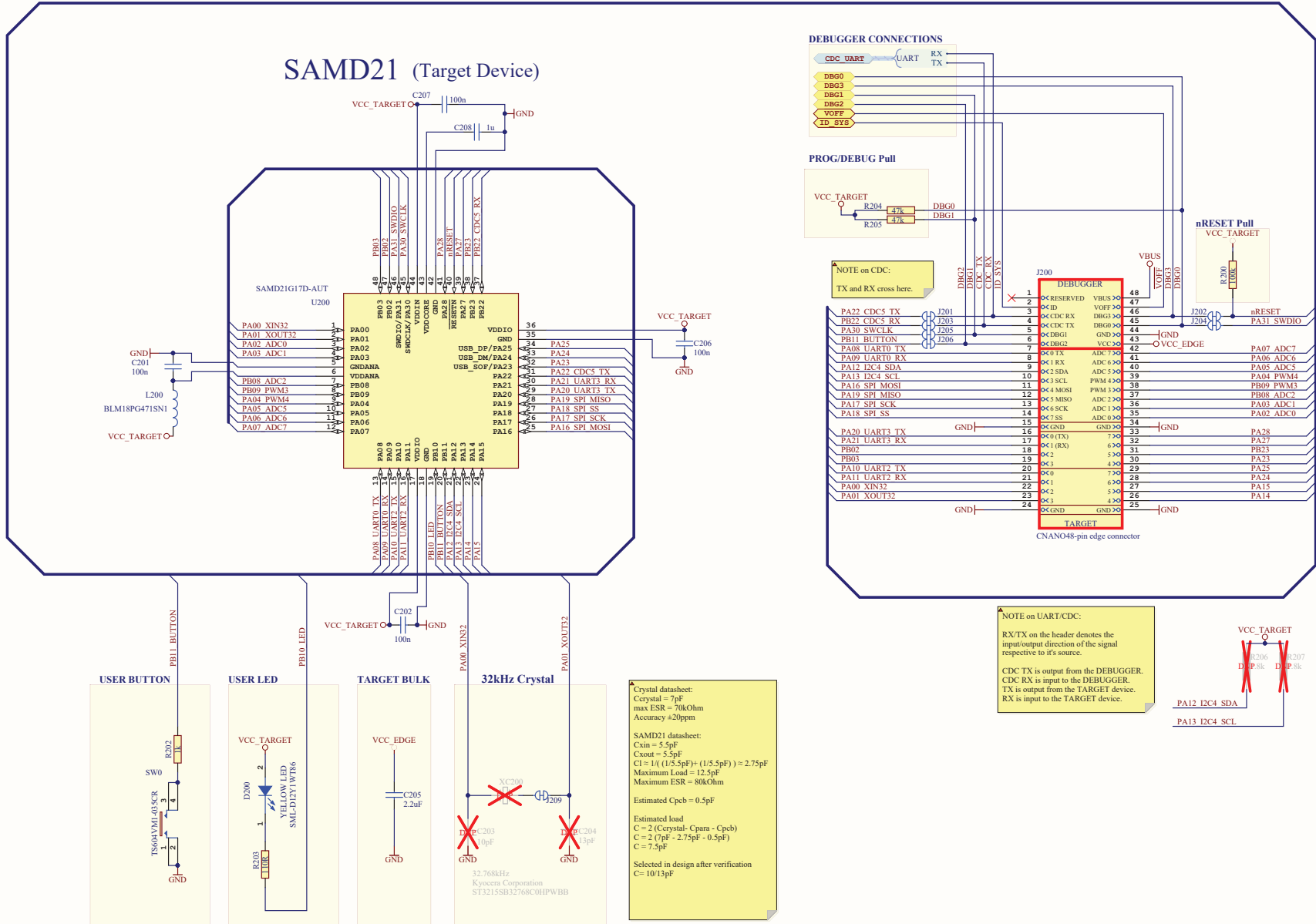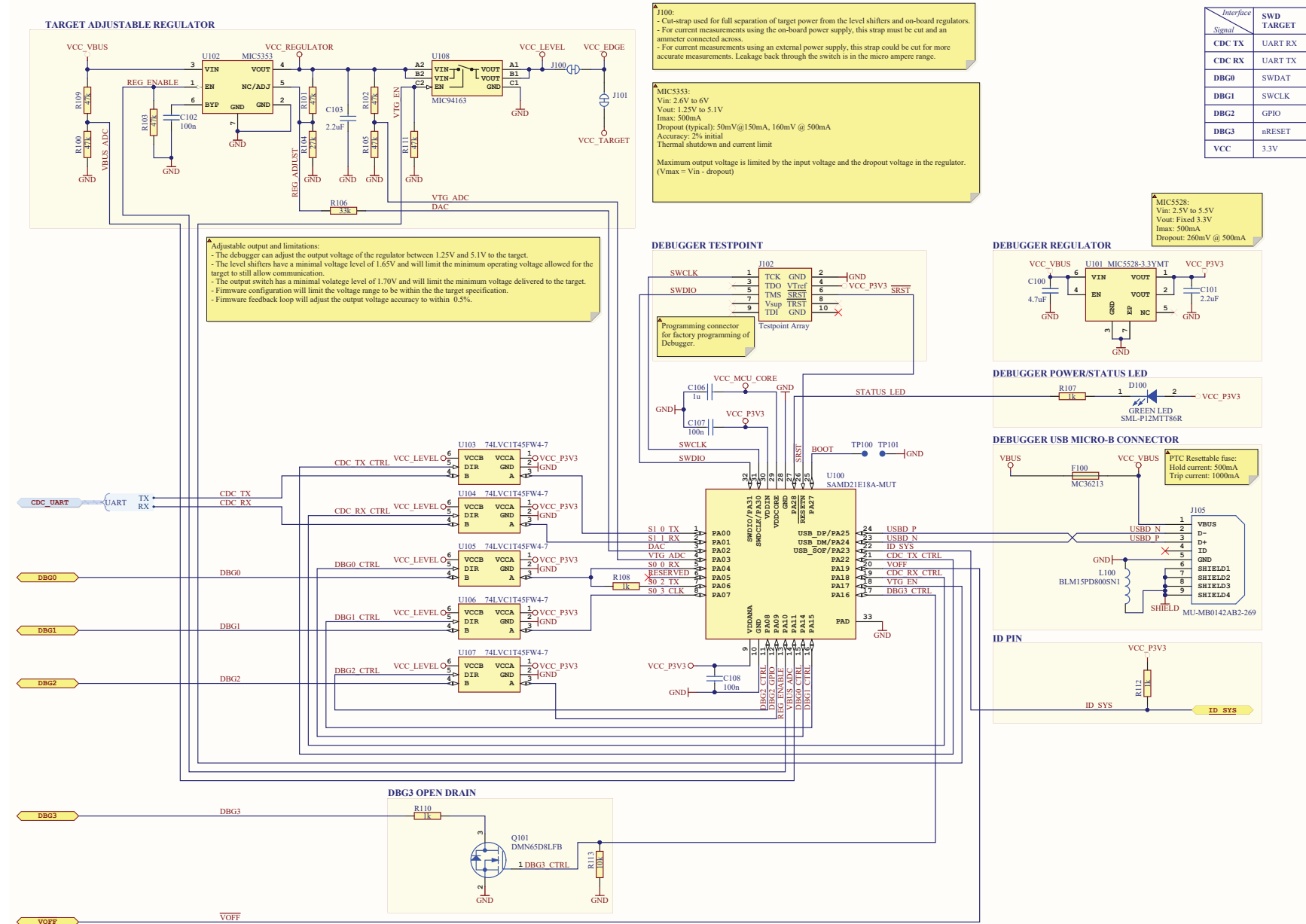
7. Document Revision History

Rev C - 07/2020

Updated the figures in the following section, and added a note:

- SAMD21G17D Curiosity Nano Pinout

Added a new section:

- SAMD21G17D Curiosity Nano Base Quick Reference

Rev B - 04/2020

Updated the pin names for the SAMD21G17D in the Connection Details between the Target and Debugger Section Table.

Rev A - 12/2019

This is the initial released version of this document.

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