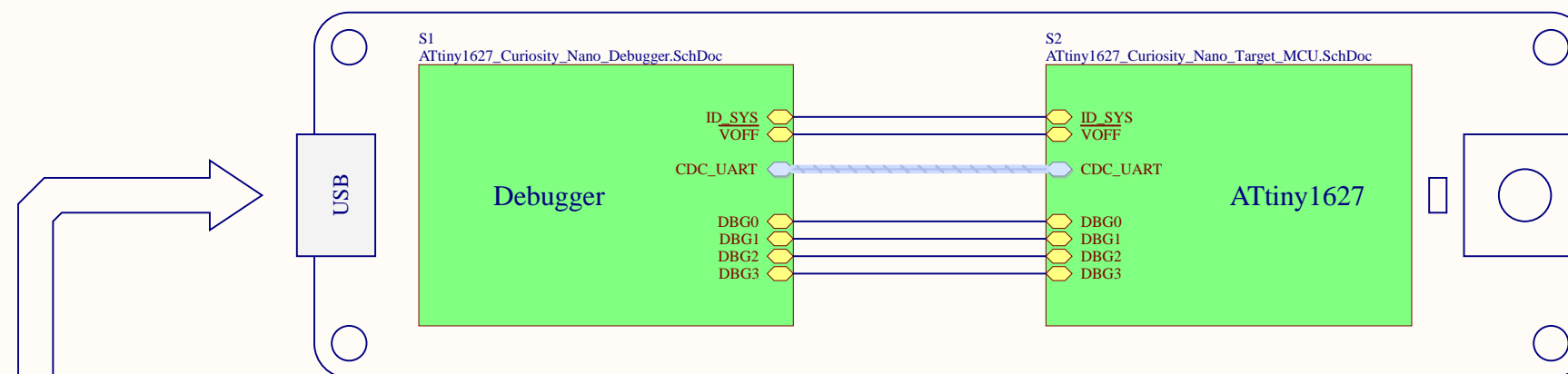
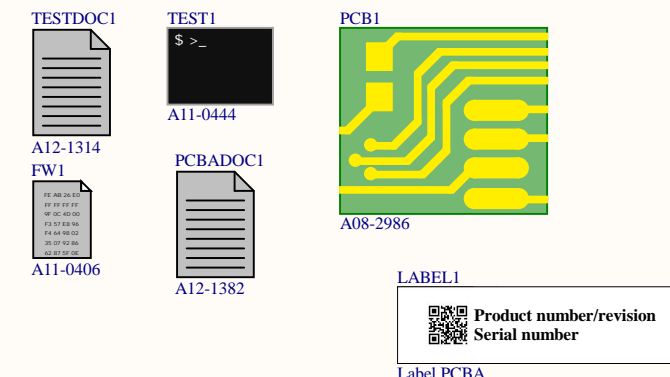
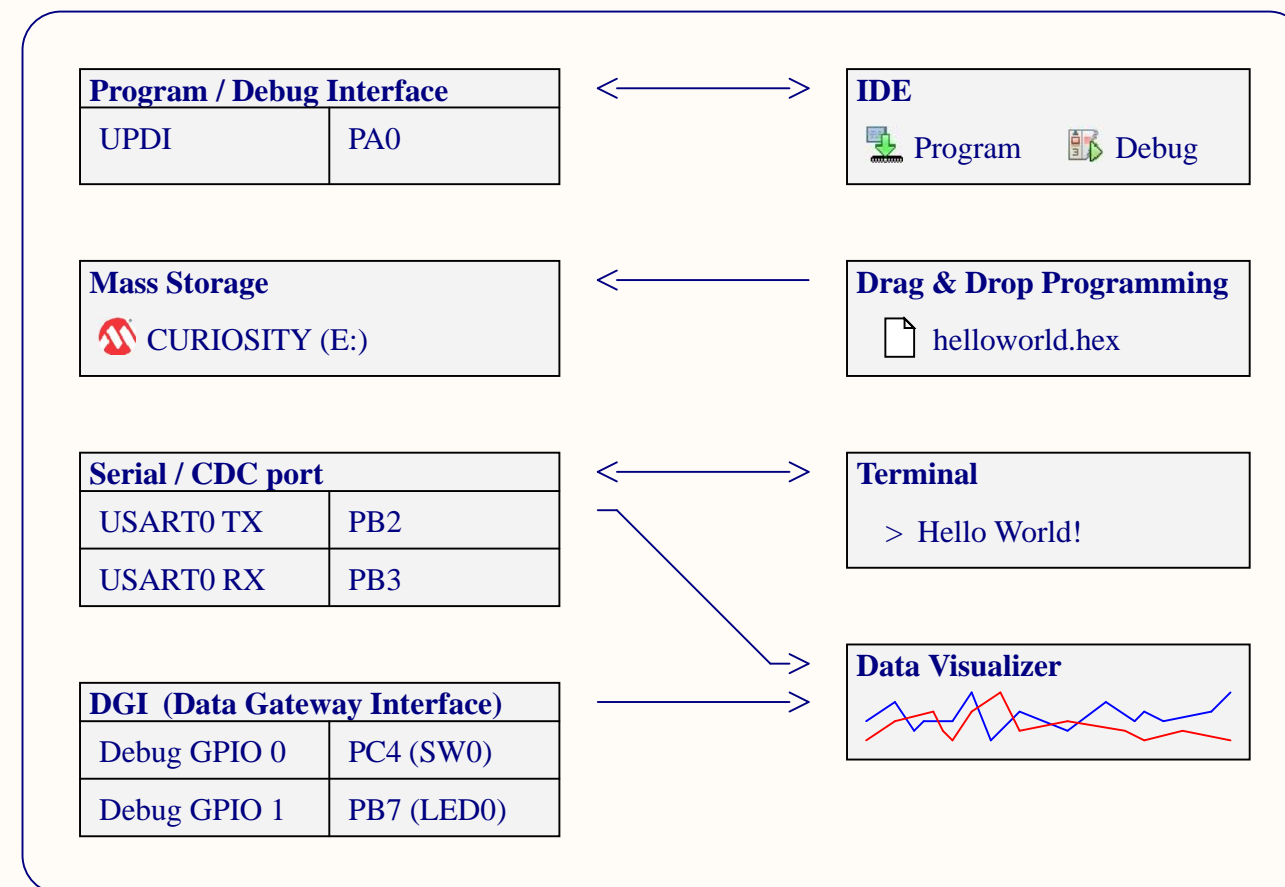


# ATtiny1627 Curiosity Nano



On-Board Peripherals		
LED0	PB7	Active Low
SW0	PC4	Active Low



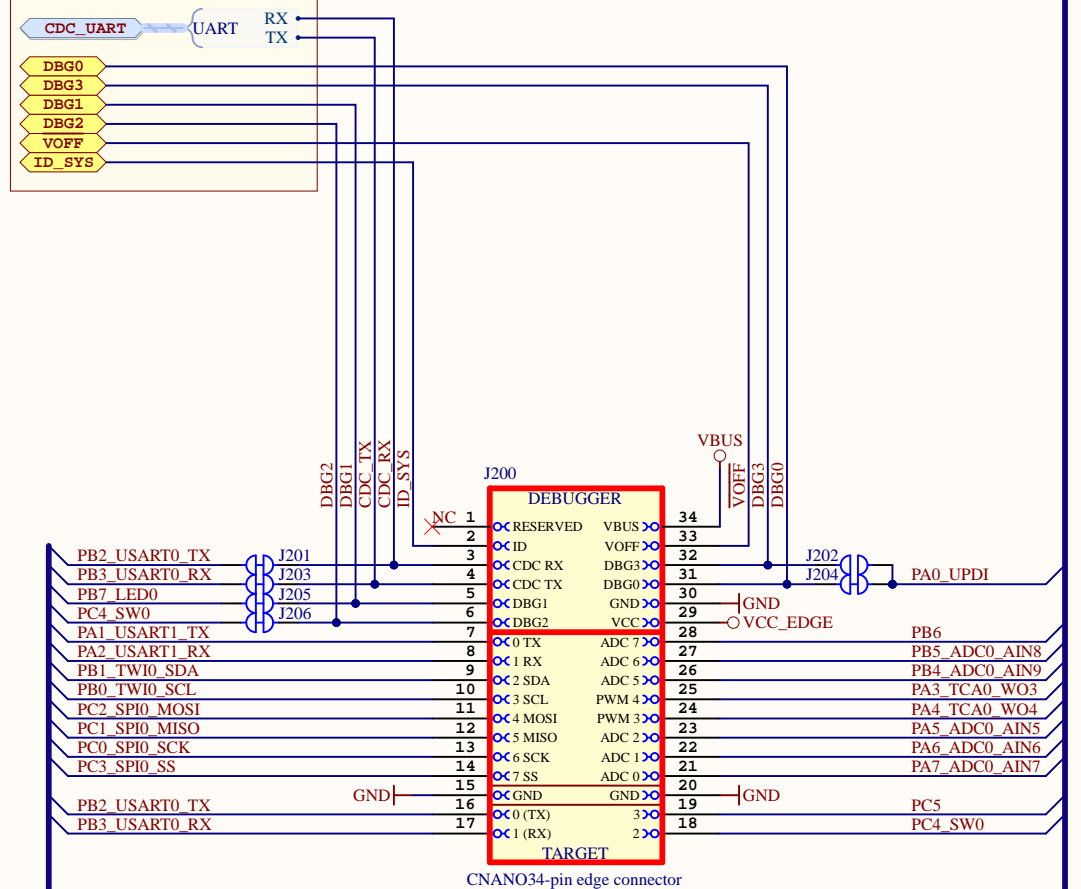
Drawn By: Microchip Norway		
Engineer: ML, TF		
Project Title <b>ATtiny1627 Curiosity Nano</b>		
Sheet Title <b>Top Level</b>		
Size A3	PCB Assembly Number: A09-3258	PCBA Revision: 2
	PCB Number: A08-2986	PCB Revision: 2
File: ATtiny1627_Curiosity_Nano_TopLevel.SchDoc	Date: 11.12.2020	
	Page: 1 of 4	

S3  
ATtiny1627\_Curiosity\_Nano\_Revision\_History.SchDoc

# ATtiny1627

ATtiny1627		
Debugger	Name	Pin
CDC TX	USART0 RX	PB3
CDC RX	USART0 TX	PB2
DBG0	UPDI	PA0
DBG1	GPIO1	PB7
DBG2	GPIO0	PC4
DBG3	NA	-
VTG	1.8V - 5.5V	

## DEBUGGER CONNECTIONS



**NOTE on UART/CDC:**

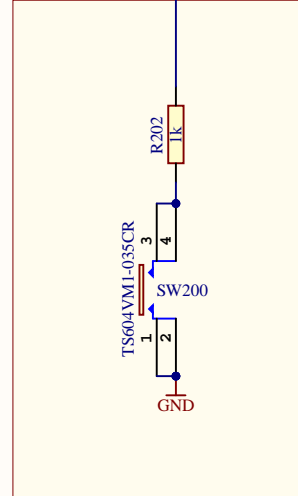
RX/TX on the header denotes the input/output direction of the signal respective to it's source.

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.

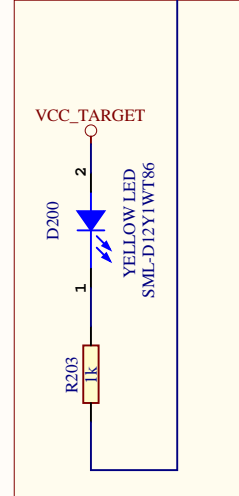
**NOTE on I2C:**

No pull-ups on board. Pull-ups should be mounted close to client device(s).

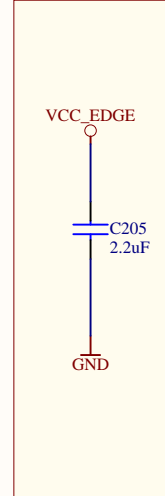
## USER BUTTON



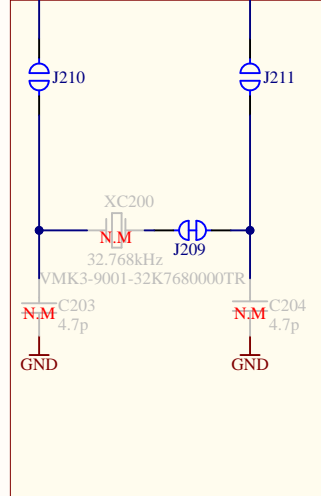
## USER LED



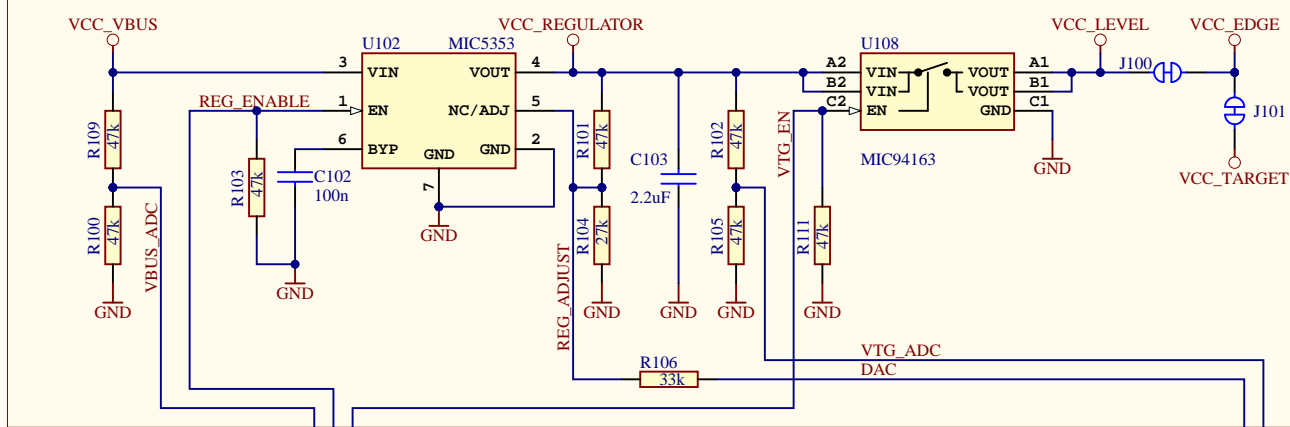
## TARGET BULK



## 32kHz CRYSTAL



## TARGET ADJUSTABLE REGULATOR



Adjustable output and limitations:

- The DEBUGGER can adjust the output voltage of the regulator between 1.25V and 5.1V to the target.
- The voltage output is limited by the input (USB), which can vary between 4.40V to 5.25V
- 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 MIC94163 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 target specification.

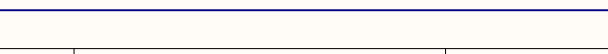
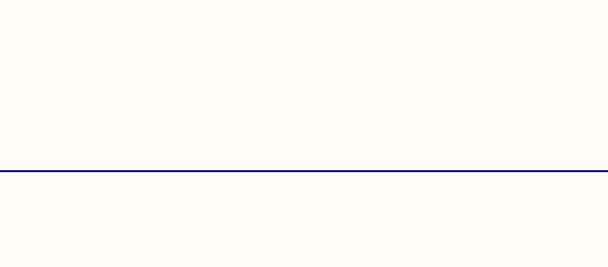
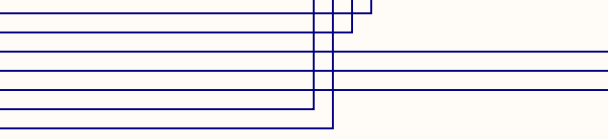
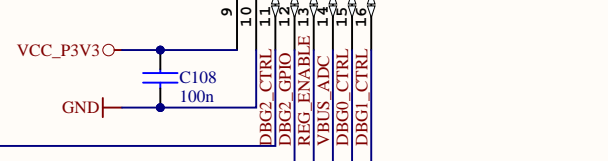
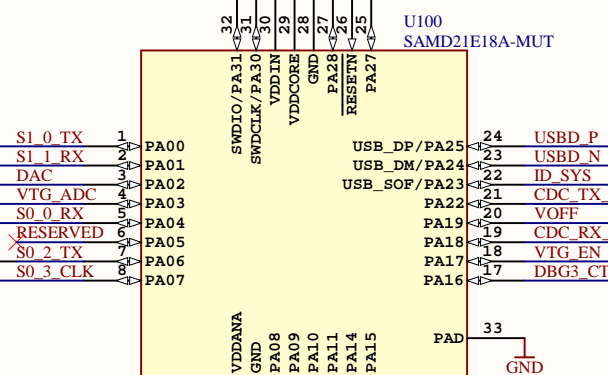
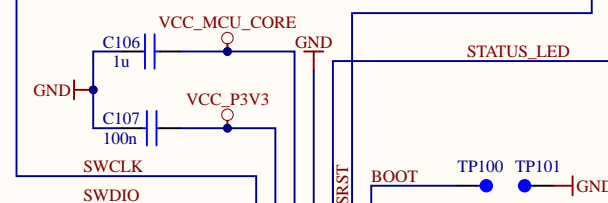
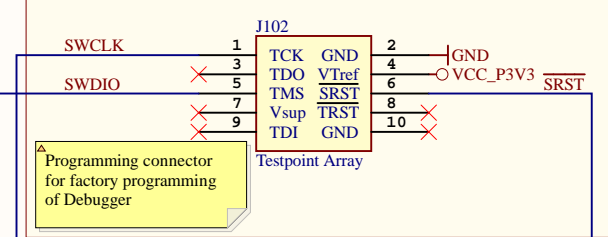
**J100:**  
Cut-strap used for full separation of target power from the level shifters and on-board regulators.  
- For current measurements using an external power supply, this strap could be cut for more accurate measurements. Leakage back through the switch is in the micro ampere range.

**J101:**  
This is footprint for a 1x2 100mil pitch pin-header that can be used for easy current measurement to the target microcontroller and the LED / Button. To use the footprint:  
- Cut the track between the holes, and mount a pin-header

**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)

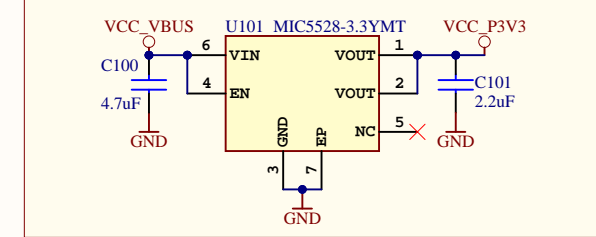
## DEBUGGER TESTPOINTS



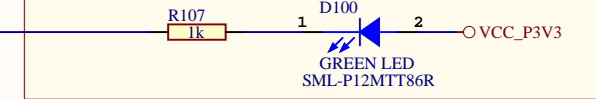
Interface	ICSP TARGET	UPDI TARGET	SWD TARGET
CDC TX	UART RX	UART RX	UART RX
CDC RX	UART TX	UART TX	UART TX
DBG0	DAT	UPDI	SWDAT
DBG1	CLK	GPIO	SWCLK
DBG2	GPIO	GPIO	SWO/GPIO
DBG3	MCLR	RESET	RESET
VCC	-	-	-

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

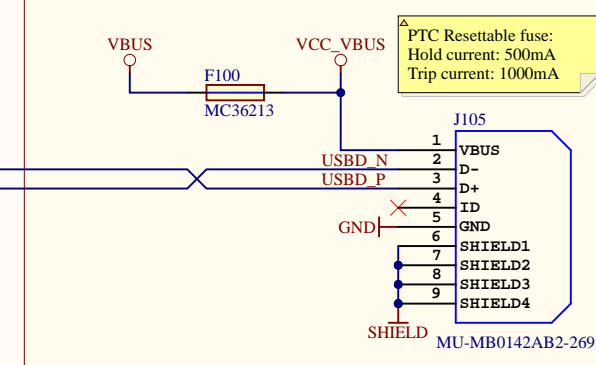
## DEBUGGER REGULATOR



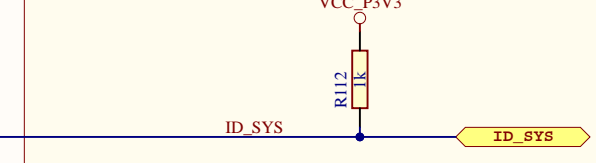
## DEBUGGER POWER/STATUS LED



## DEBUGGER USB MICRO-B CONNECTOR



## ID PIN



Drawn By:  
Microchip Norway  
Engineer:  
TF, HN



Project Title  
**ATtiny1627 Curiosity Nano**

Sheet Title  
**Debugger**

Size A3 PCB Assembly Number: A09-3258

PCB Number: A08-2986

PCBA Revision: 2

PCB Revision: 2

Designed with  
**Altium**

Altium.com

Date: 11.12.2020

Page: 3 of 4

# Revision History

## PCB Assembly Rev 1:

Design Changes:

Initial Design

PCB:

PCB revision 1

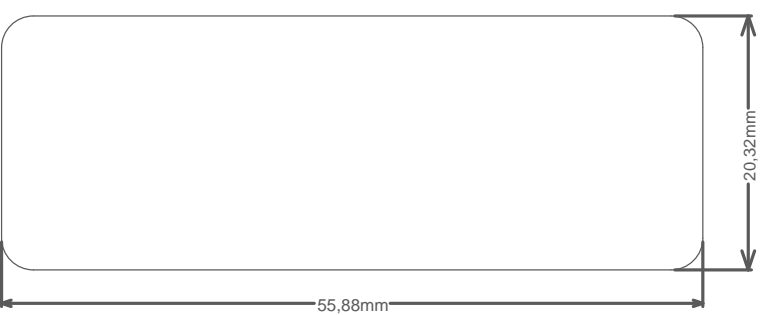
## PCB Assembly Rev 2:

Design Changes:

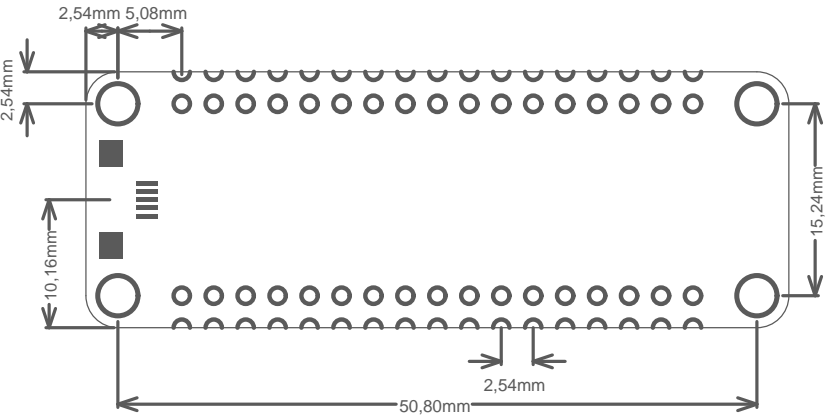
Added solderstrap jumper with holes between edge connector power (VCC) and VCC\_TARGET.

PCB:

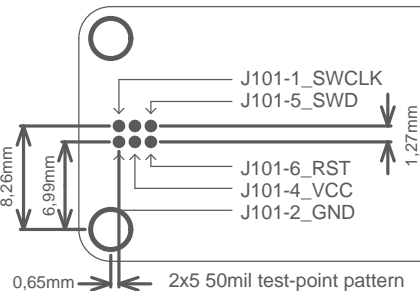
PCB Revision 2  
Updated J200 (edge pin header connector) with staggered footprint, and adjusted traks, polygons, teardrops, and text accordingly.

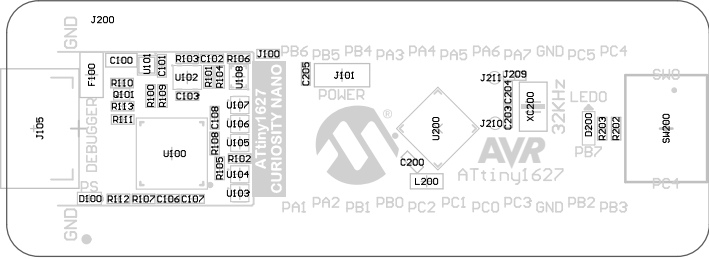


# Connector Placement



# Test Point Placement







A08-2986 Rev2  
Microchip © 2019

LABEL1

J212 PB2

J213 PB3



TARGET

PA0	J202	D3
PC4	J206	D2
PB7	J205	D1
PA0	J204	D0
PB2	J201	RX
PB3	J203	TX

DEBUGGER

CONNECTIONS



TP101

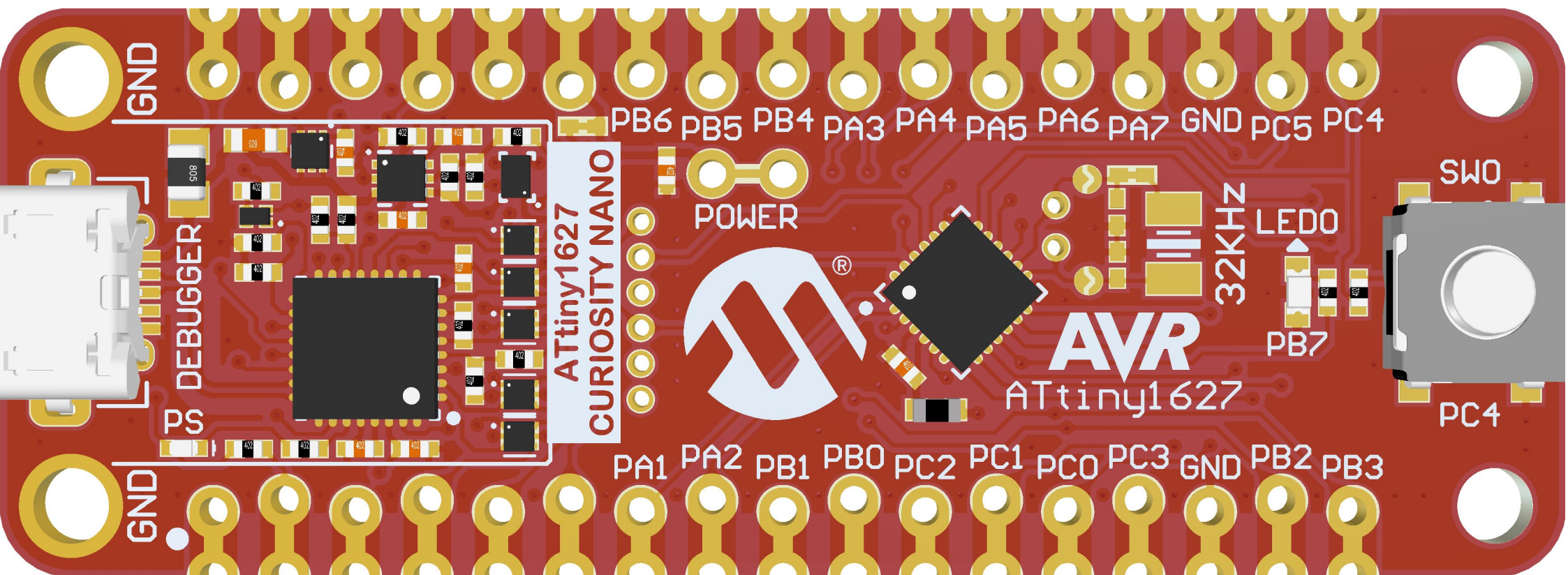
TP100

GND

J102

GND

PC4 PC5 GND PA7 PA6 PA5 PA4 PA3 PB4 PB5 PB6 VTTG GND D0 D3 VOFF VBUS  
PB3 PB2 GND PC3 PC0 PC1 PC2 PB0 PB1 PA2 PA1 D2 D1 TX RX ID NC  
CDC BOOT



**A08-2986 Rev2**  
**Microchip © 2019**

PB2  
PB3



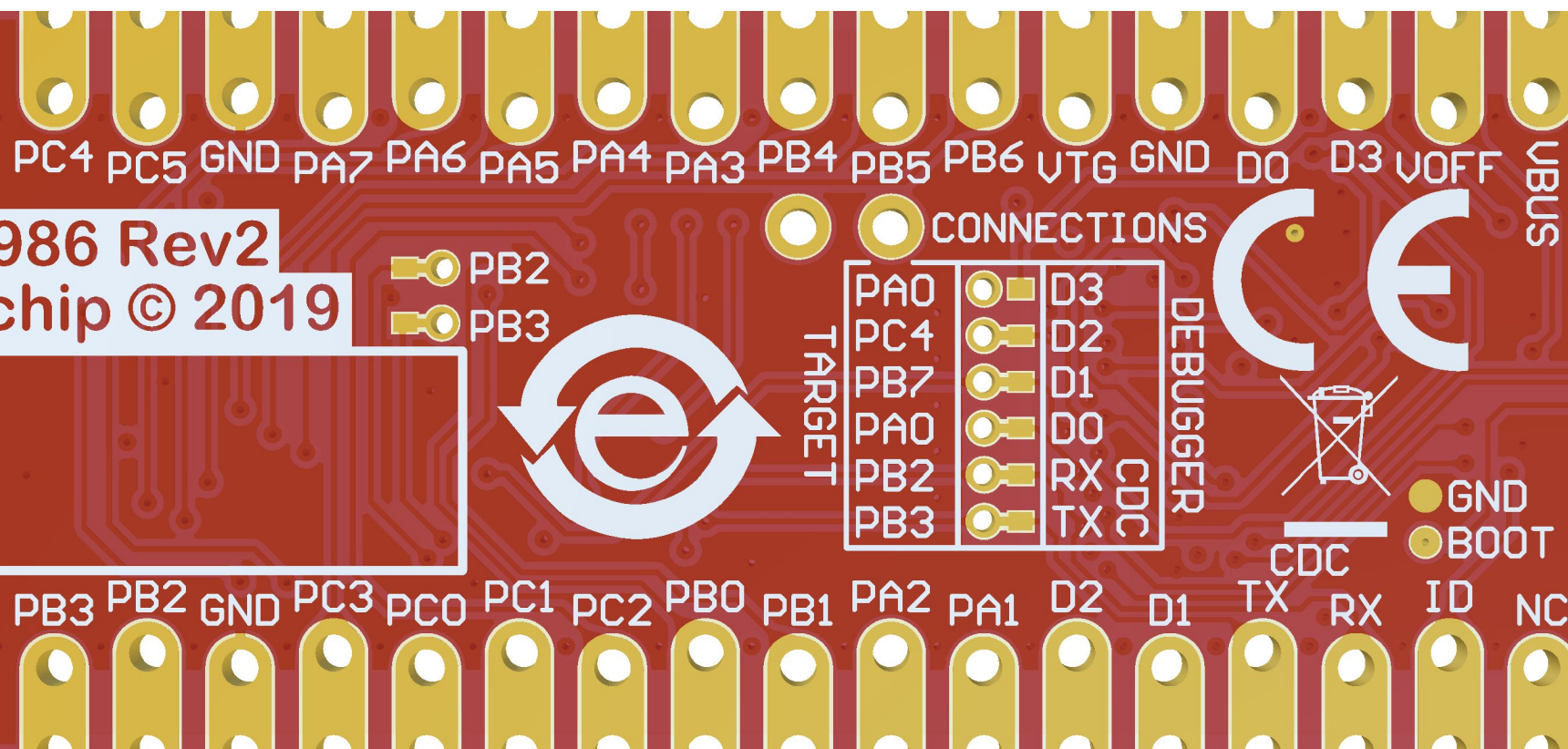
TARGET

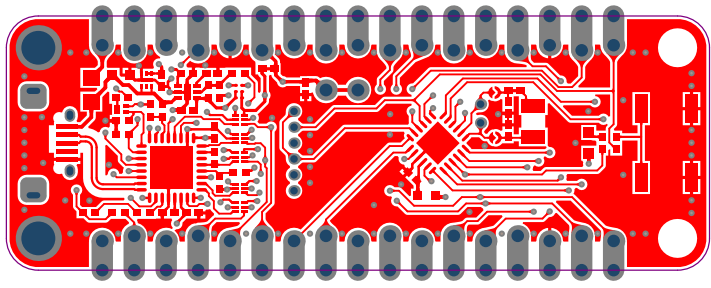
PA0		D3
PC4		D2
PB7		D1
PA0		D0
PB2		RX
PB3		TX

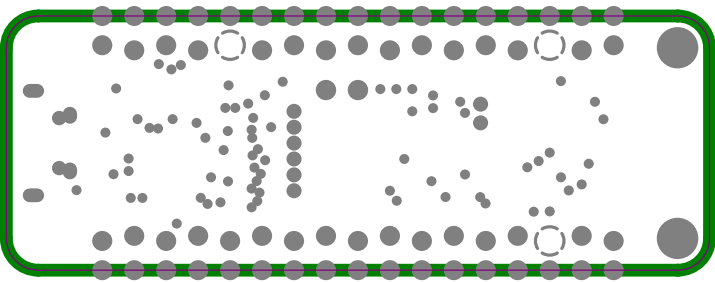
DEBUGGER

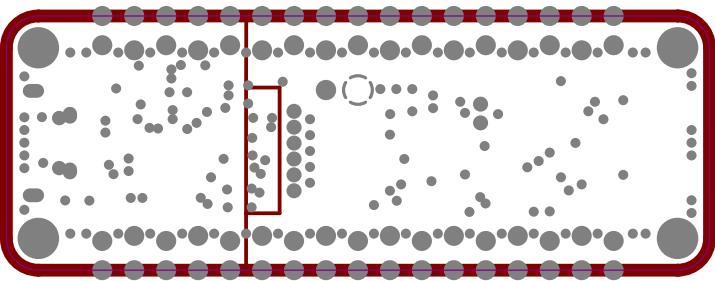


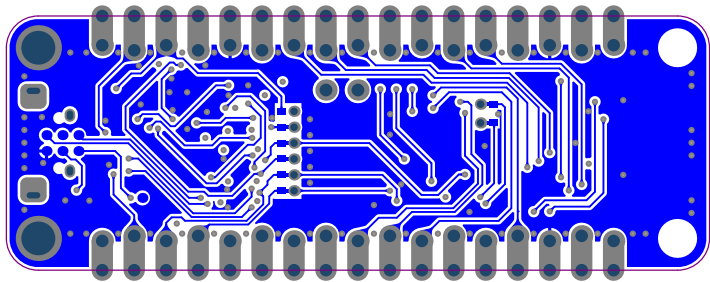
GND  
BOOT











# Component list

Bill of Materials Fitted for Variant [Default Assembly] of Project [ATtiny1627 Curiosity Nano.PrjPcb] (No PCB Document Selected)

Source Data From: ATtiny1627 Curiosity Nano.PrjPcb  
Project: ATtiny1627 Curiosity Nano.PrjPcb  
Variant: Default Assembly



Report Date: 11.12.2020 16:28  
Print Date: 11.12.2020 16:28:12

Fitted	Designator	Quantity	Value	Manufacturer	MPN	Description
Fitted	C100	1	4.7uF	WALSIN Technology Corporation	0603X475K100CT	Ceramic capacitor, SMD 0603, X5R, 10V, 10% (de31036)
Fitted	C101	1	2.2uF	Kemet	C0402C225M9PAC	Ceramic capacitor, SMD 0402, X5R, 6.3V, +/-20%
Fitted	C102, C107, C108, C200	4	100n	Kemet	C0402C104K4RACTU	Ceramic capacitor, SMD 0402, X7R, 16V, +/-10%
Fitted	C103, C205	2	2.2uF	tdk	C1005X5R1A225K	CAP CER 2.2UF 10V 10% X5R 0402
Fitted	C106	1	1u	Kemet	C0402C105K9PAC	Ceramic capacitor, SMD 0402, X5R, 6.3V, +/-10% (de26942)
Fitted	D100	1	GREEN LED	ROHM	SML-P12MTT86R	LED, SMD 0402, Green, Wave length=569nm, 2.1mcd @ (1mA, 1.9Vf) rohm
Fitted	D200	1	YELLOW LED	ROHM	SML-D12Y1WT86	LED, SMD 0603, Yellow, Wave length=590nm, 100mcd @ (20mA, 2.2Vf) rohm
Fitted	F100	1	MC36213	Multicomp	MC36213	Resetable PTC fuse, Ih = 0.5A, It = 1.0A, 0805 package
Fitted	FW1	1	nEDBG firmw are			nEDBG firmw are
Fitted	J105	1	MU-MB0142AB2-269	Allen Creations Corp.	MU-MB0142AB2-269	USB micro AB, Surface mount signals and DIP shield
Fitted	L200	1	BLM18PG471SN1	Murata	BLM18PG471SN1	SMD RF inductor 0603, Z=470Ohm (@ 100MHz), Max R(dc)=0.65Ohm, Max current=1A
Fitted	LABEL1	1	Label PCBA	ACT Logimark AS	505462	PCBA identification label PP Top White Gloss
Fitted	PCB1	1	ATtiny1627 Curiosity Nano PCB FAB Documentation			ATtiny1627 Curiosity Nano PCB FAB Documentation
Fitted	PCBDOC1	1	A09-3258 PCBA Files			ATtiny1627 Curiosity Nano PCBA Documentation
Fitted	Q101	1	DMN65D8LFB	Diodes Incorporated	DMN65D8LFB-7	N-channel MOSFET, DFN1006-3 (SOT883), 60V, 330mA, 4Ohm
Fitted	R100, R101, R102, R103, R105, R109, R111, R113	8	47k	KOA	RK73H1ETTP4702F	Thick film resistor, SMD 0402, 1/16W, 1%
Fitted	R104	1	27k	YAGEO CORP	RC0402FR-0727KL	Thick film resistor, SMD 0402, 1/16W, 1%
Fitted	R106	1	33k	ASJ	CR10-3302-FK	Thick film resistor, SMD 0402, 1/16W, 1%
Fitted	R107, R108, R110, R112, R202, R203	6	1k	ASJ	CR10-1001-FK	Thick film resistor, SMD 0402, 1/16W, 1%
Fitted	SW200	1	TS604VM1-035CR	Dailywell Electronics Co.LTD	TS604VM1-035CR-R	SWITCH, SMD, 260gf, 6.4mm X 6.2mm
Fitted	TEST1	1	ATtiny1627 Curiosity Nano Test			Fixture Test for ATtiny1627 Curiosity Nano
Fitted	TESTDOC1	1	Curiosity Nano Test Instructions			Generic Test Instructions for Curiosity Nano
Fitted	U100	1	SAMD21E18A-MUT	Microchip	ATSAMD21E18A-MUT	Atmel 32-bit RISC MCU 32pin
Fitted	U101	1	MIC5528-3.3YMT	Microchip	MIC5528-3.3YMT-T5	LDO 3.3V 0.5A 6TDFN
Fitted	U102	1	MIC5353	Microchip	MIC5353YMT-TR	500mA Ultra Low Dropout LDO regulator, 2% accuracy, 1.6x1.6mm MLF
Fitted	U103, U104, U105, U106, U107	5	74LVC1T45FW4-7	Diodes Incorporated	74LVC1T45FW4-7	Single-Bit Dual-Supply Transceiver, 1.65-5.5 Translation and 3-State Outputs
Fitted	U108	1	MIC94163	Microchip Technology Inc	MIC94163YCS-TR	Loadswitch, Rds(on) = 14.5mohm, 1.0mm x 1.5mm WLCSP, reverse blocking
Fitted	U200	1	ATtiny1627-MFR	Microchip	ATtiny1627-MFR	ATtiny1627 AVR MCU, 24 pin VQFN
Not Fitted	C203, C204	0	4.7p	YAGEO CORP	CC0402CRNP09BN4R7	Ceramic capacitor, SMD 0402, NP0, 50V, +/-0.25pF
Not Fitted	XC200	0	32.768kHz	Microchip	VMK3-9001-32K7680000TR	Crystal, 32.768kHz, CL=9.0pF, ESR=70kOhm, SMD LxW=3.2 x 1.5mm, 20ppm

	48	
Approved	Notes	