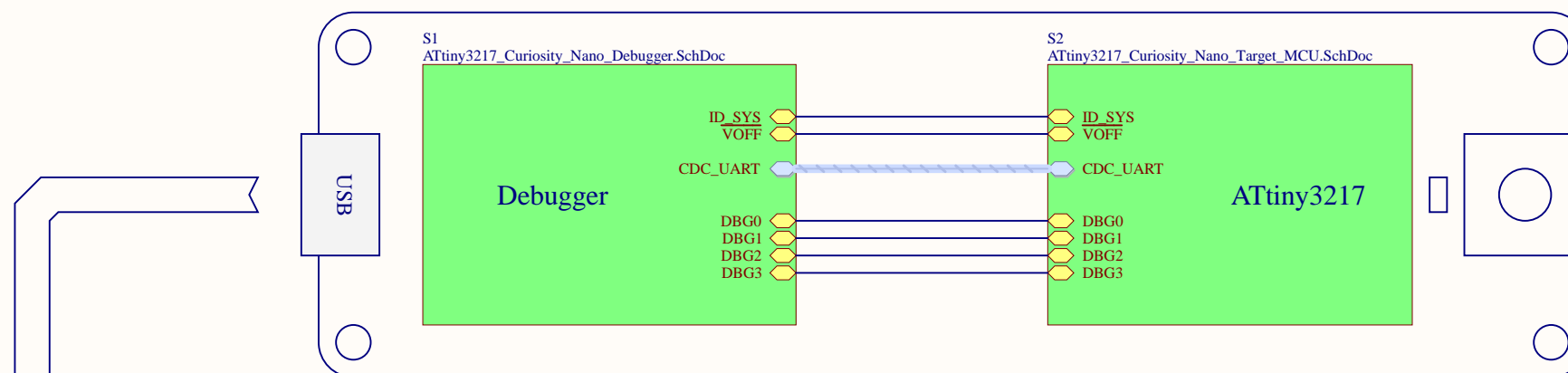
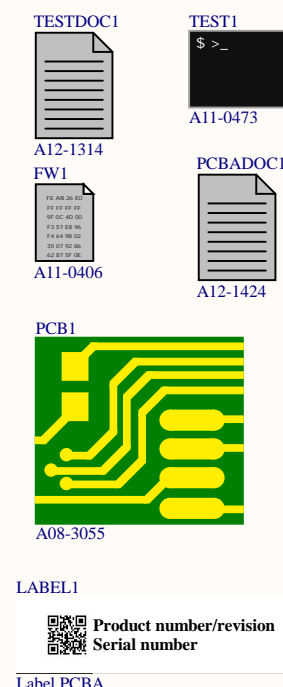
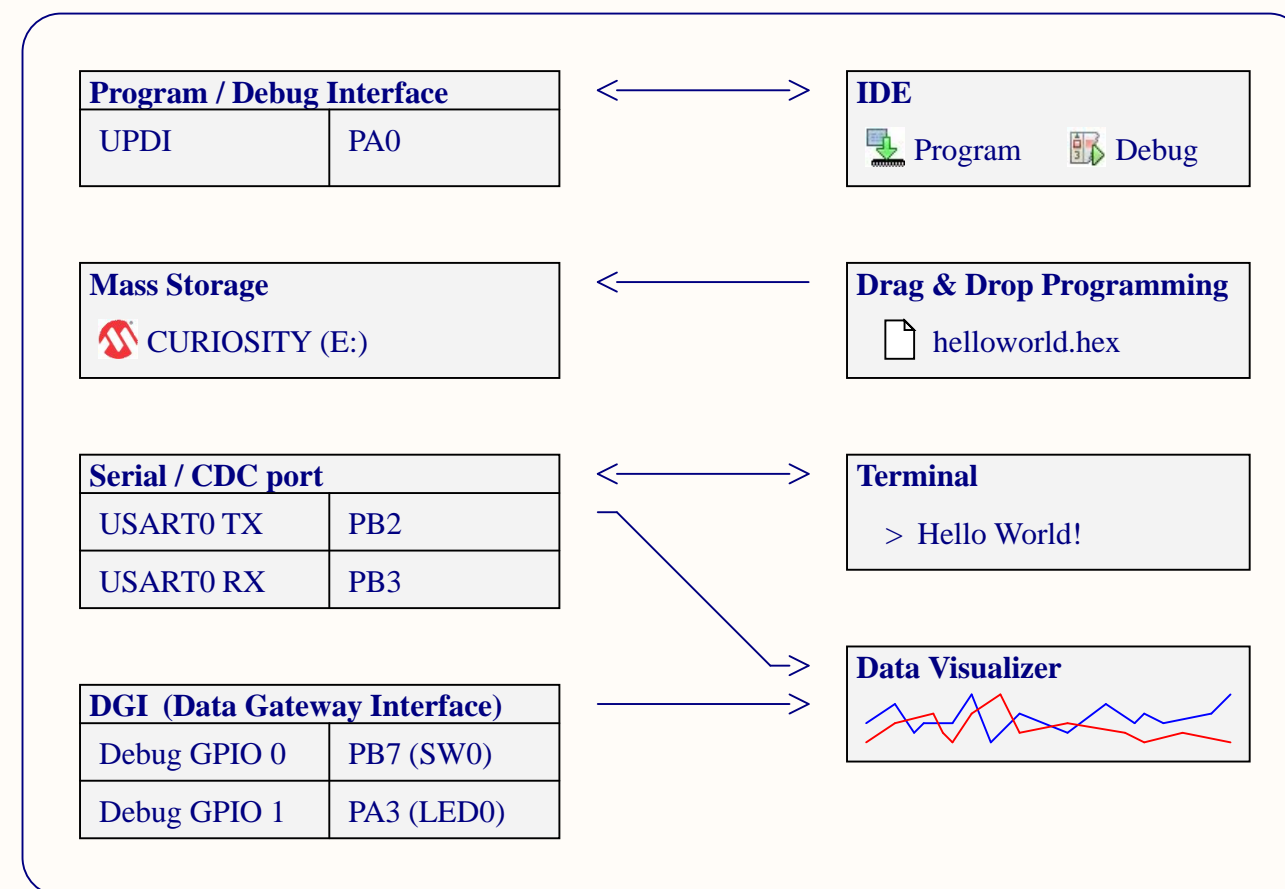



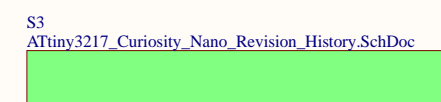
# ATtiny3217 Curiosity Nano



On-Board Peripherals		
LED0	PA3	Active Low
SW0	PB7	Active Low



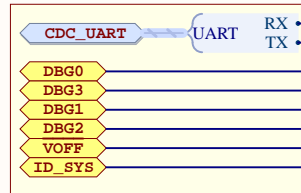
Drawn By: M.LOPER		 MICROCHIP		
Engineer: PB / TF				
Project Title <b>ATtiny3217 Curiosity Nano</b>				<i>Designed with</i> <b>Altium</b> <a href="http://Altium.com">Altium.com</a>
Sheet Title <b>Top Level</b>				
Size A3	PCB Assembly Number: A09-3333		PCBA Revision: 2	
	PCB Number: A08-3055		PCB Revision: 2	Date: 2/20/2020
File: ATtiny3217_Curiosity_Nano_TopLevel.SchDoc				Page: 1 of 4



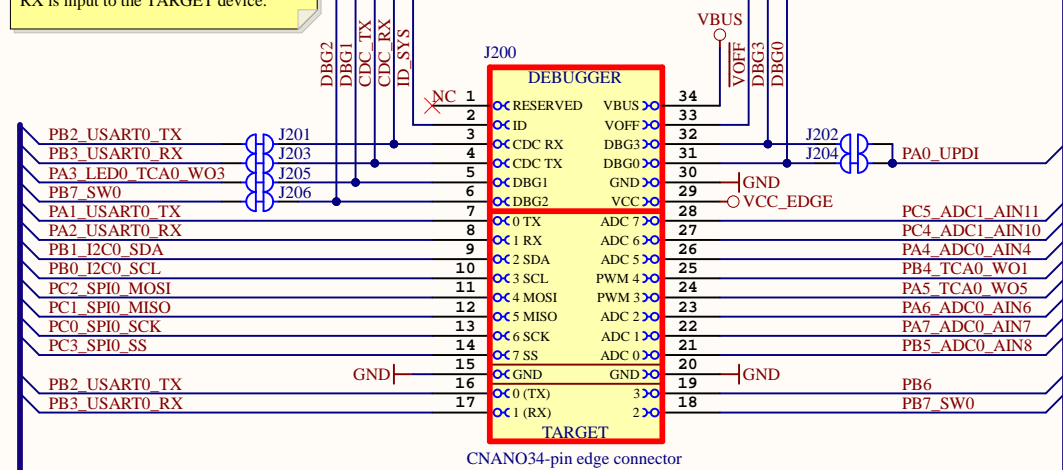
# ATtiny3217

ATtiny3217		
Debugger	Name	Pin
CDC TX	USART0 RX	PB3
CDC RX	USART0 TX	PB2
DBG0	UPDI	PA0
DBG1	GPIO1	PA3
DBG2	GPIO0	PB7
DBG3	NA	-
VTG	1.8V - 5.5V	

## DEBUGGER CONNECTIONS

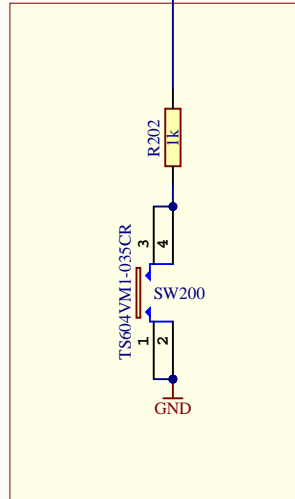


**NOTE on UART/CDC:**  
RX/TX on the header denotes the input/output direction of the signal respective to it's source.  
CDC TX is output from the DEBUGGER.  
CDC RX is input to the DEBUGGER.  
TX is output from the TARGET device.  
RX is input to the TARGET device.

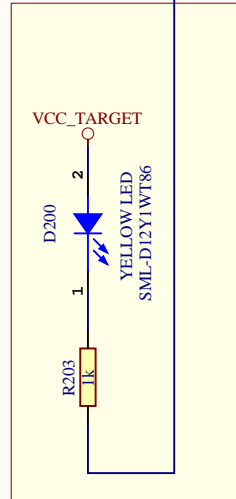


**NOTE on I2C:**  
No pull-ups on board. Pull-ups should be mounted close to slave device(s).

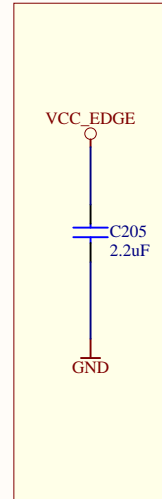
## USER BUTTON



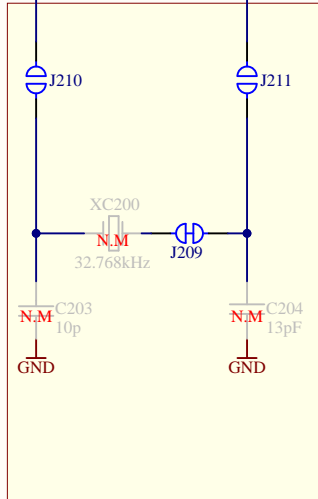
## USER LED



## TARGET BULK

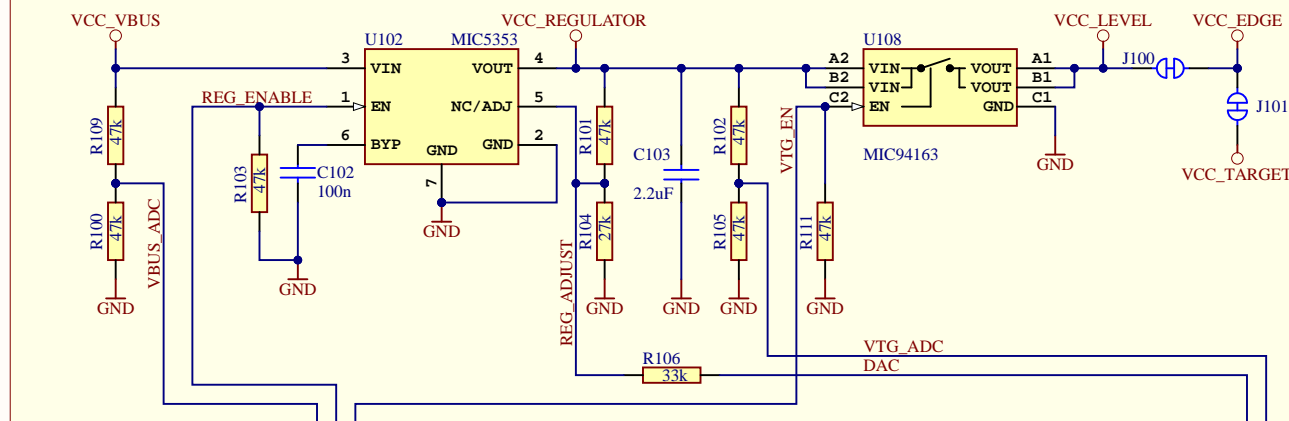


## 32kHz CRYSTAL



**Crystal datasheet:**  
Crystall = 7pF  
max ESR = 70kOhm  
Accuracy ±20ppm  
  
**ATtiny3217 datasheet:**  
C<sub>xin</sub> = 5.5pF  
C<sub>xout</sub> = 5.5pF  
C<sub>l</sub> ≈ 1/( (1/5.5pF) + (1/5.5pF) ) ≈ 2.75pF  
Maximum ESR @ 12.5pF = 40kOhm  
Maximum ESR @ 7.5pF = 80kOhm  
  
Estimated C<sub>pcb</sub> = 0.5pF  
  
Estimated load  
C = 2 (C<sub>crystal</sub> - C<sub>para</sub> - C<sub>pcb</sub>)  
C = 2 (7pF - 2.75pF - 0.5pF)  
C = 7.5pF  
  
Selected in design after verification  
C = 10/13pF

## 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

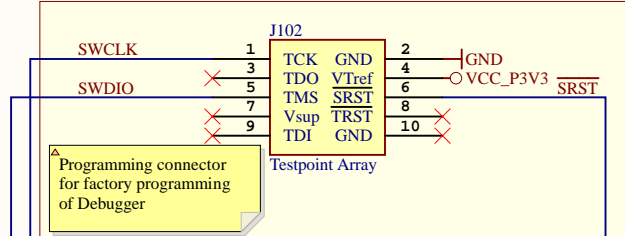
MIC5353:  
 Vin: 2.6V to 6V  
 Vout: 1.25V to 5.1V  
 I<sub>max</sub>: 500mA  
 Dropout (typical): 50mV @ 150mA, 160mV @ 500mA  
 Accuracy: 2% initial  
 Thermal shutdown and current limit

Maximum output voltage is limited by the input voltage and the dropout voltage in the regulator.  
 ( $V_{max} = V_{in} - \text{dropout}$ )

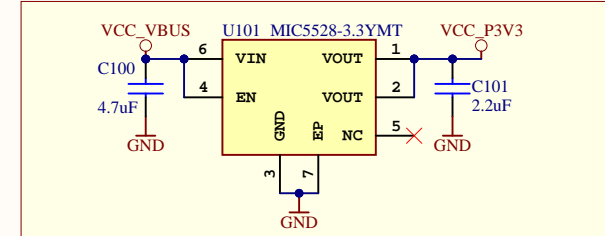
<i>Interface</i> <i>Signal</i>	ICSP TARGET	UPDI TARGET
CDC TX	UART RX	UART RX
CDC RX	UART TX	UART TX
DBG0	DAT	UPDI
DBG1	CLK	GPIO
DBG2	GPIO	GPIO
DBG3	$\overline{\text{MCLR}}$	$\overline{\text{RESET}}$
VCC	-	-

MIC5528:  
 Vin: 2.5V to 5.5V  
 Vout: Fixed 3.3V  
 I<sub>max</sub>: 500mA  
 Dropout: 260mV @ 500mA

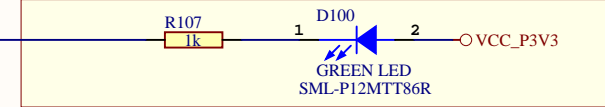
## DEBUGGER TESTPOINTS



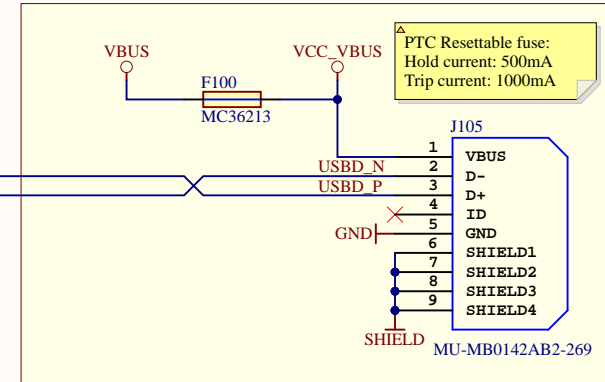
## DEBUGGER REGULATOR



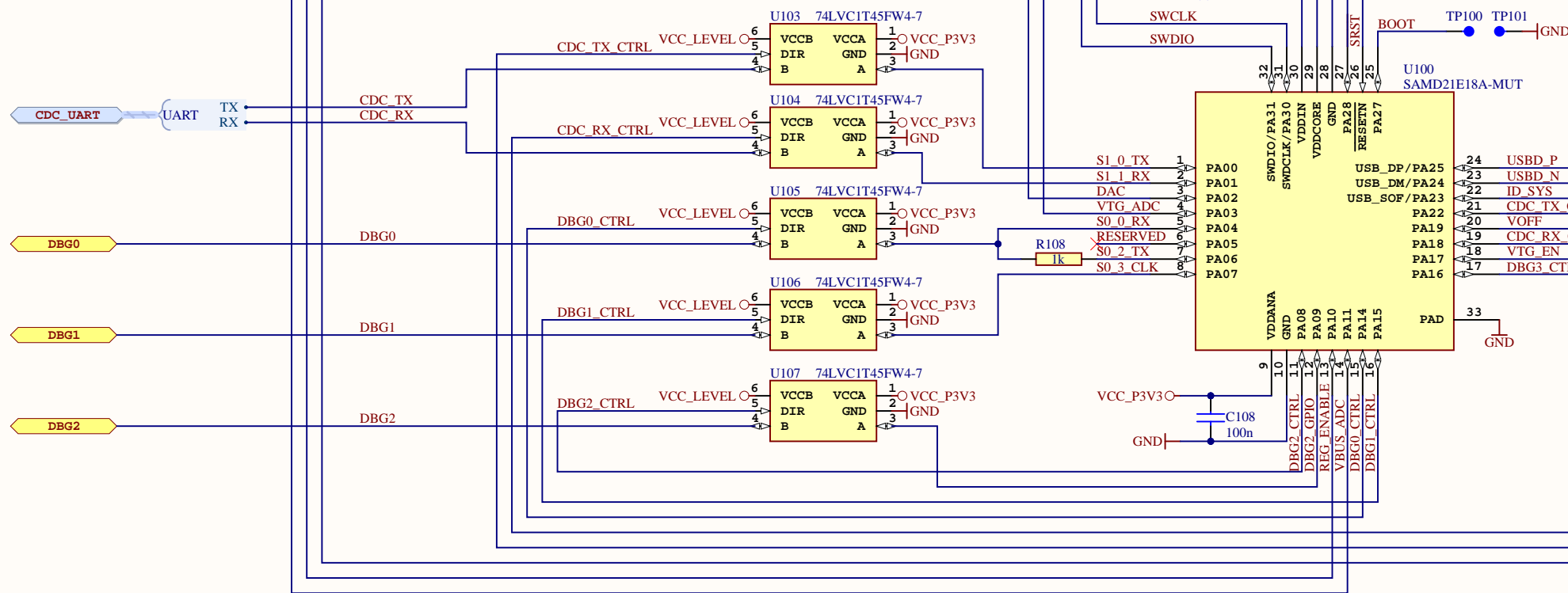
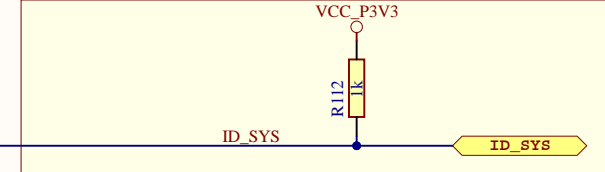
### DEBUGGER POWER/STATUS LED



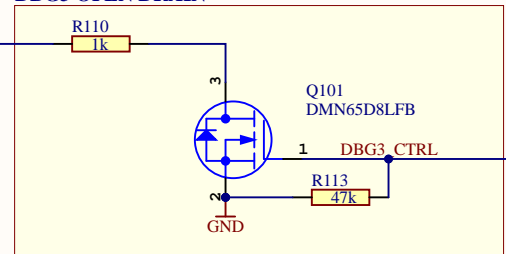
## DEBUGGER USB MICRO-B CONNECTOR



## ID PIN



### DBG3 OPEN DRAIN



△ R113 is required to pull the Q101 gate to a defined value when the U100 is not powered

# Revision History

## PCB Assembly Rev 1:

Design Changes:

Initial Design

PCB:

PCB revision 1

## PCB Assembly Rev 2:

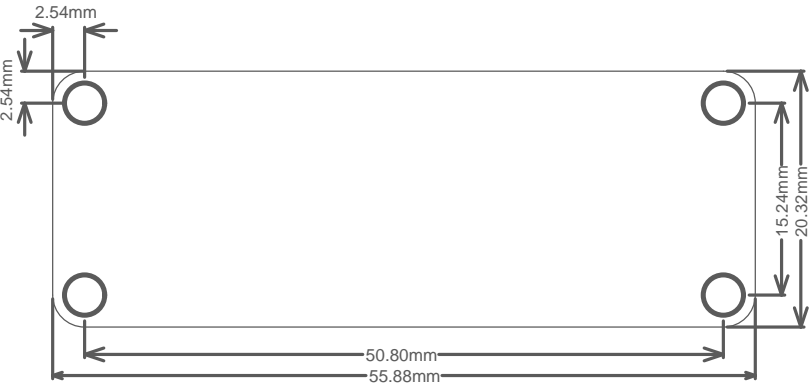
Design Changes:

On the edge connector:  
- PB7 and PA4 switched places (SW0 is now on PB7)  
- PB6 and PA7 switched places  
All pins in the ADC section now have PTC support

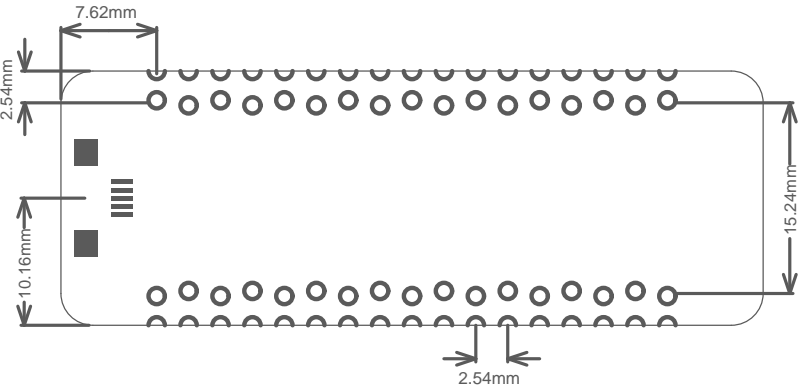
PCB:

PCB revision 2

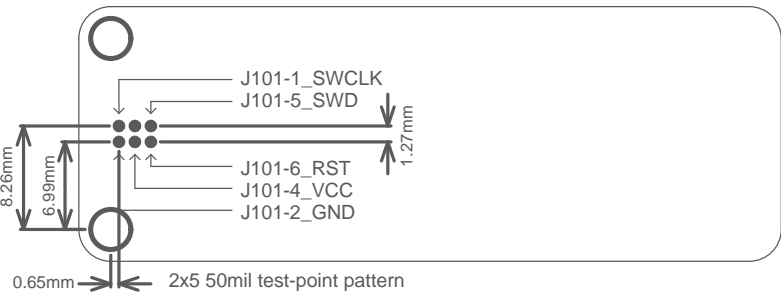
# Mechanical Dimensions

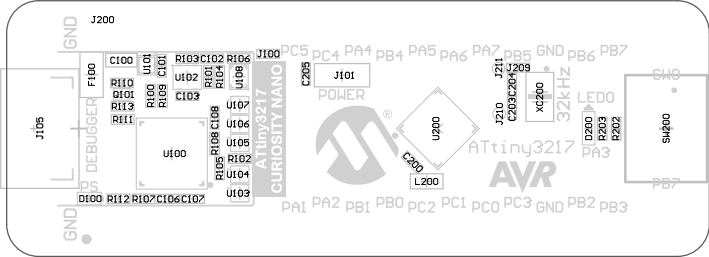


# Connector Placement



# Test Point Placement







A08-3055 Rev2  
Microchip © 2019

LABEL1

J212 PB2

J213 PB3



TARGET

CONNECTIONS

PA0	J202	D3
PB7	J206	D2
PA3	J205	D1
PA0	J204	D0
PB2	J201	RX
PB3	J203	TX

DEBUGGER

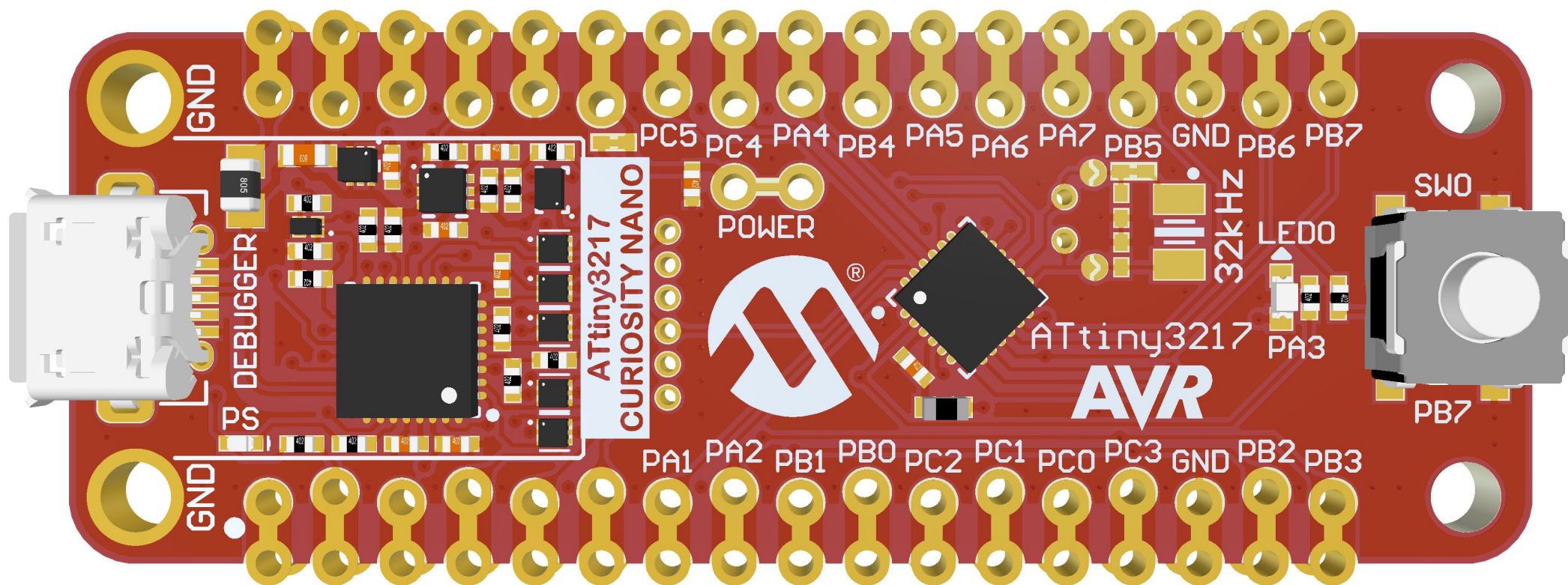


TP101 GND

TP100 BOOT

CDC TX RX ID NC

J102



**A08-3055 Rev2**  
**Microchip © 2019**

● PB2  
● PB3



TARGET

PA0	●	D3
PB7	●	D2
PA3	●	D1
PA0	●	D0
PB2	●	RX
PB3	●	TX

DEBUGGER

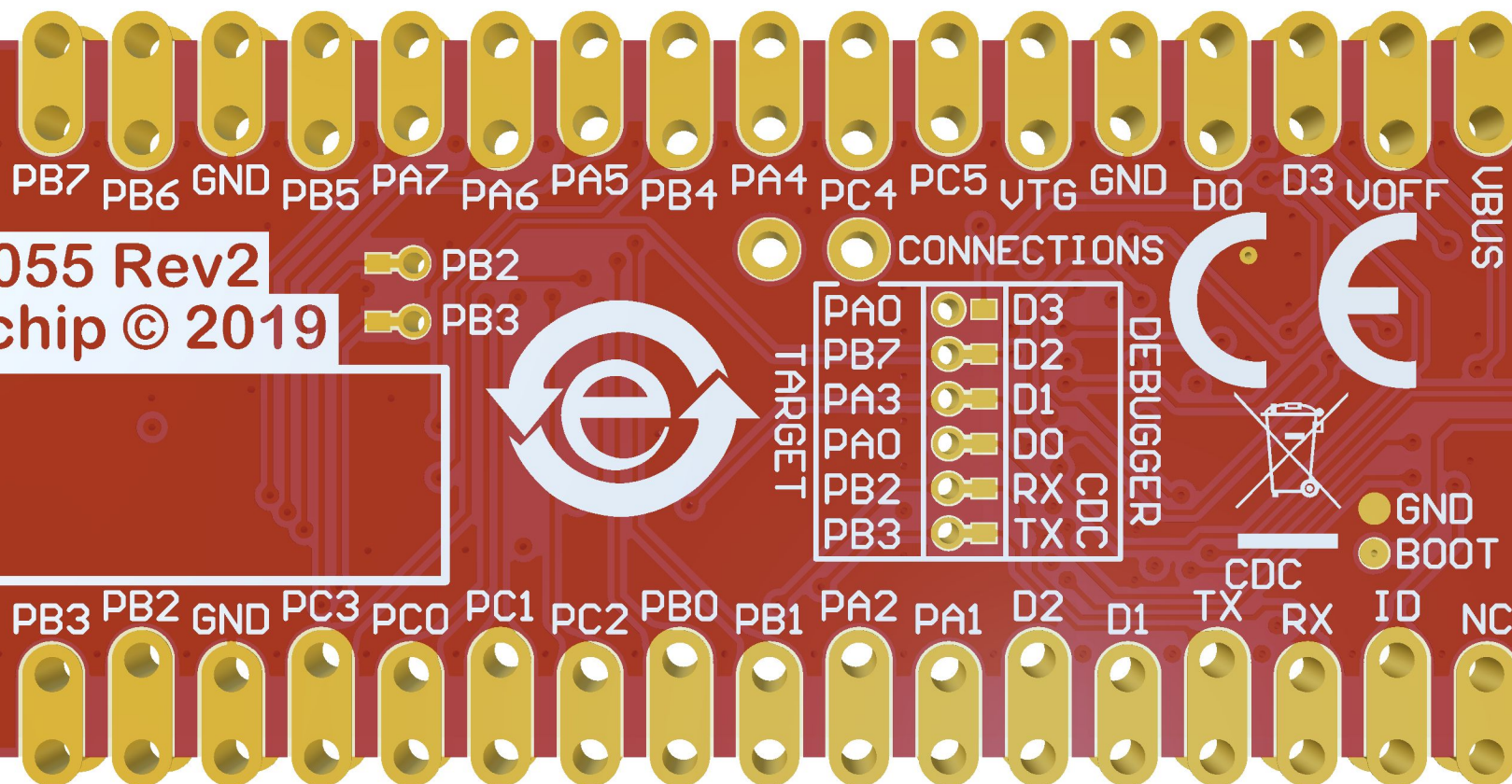
CDC

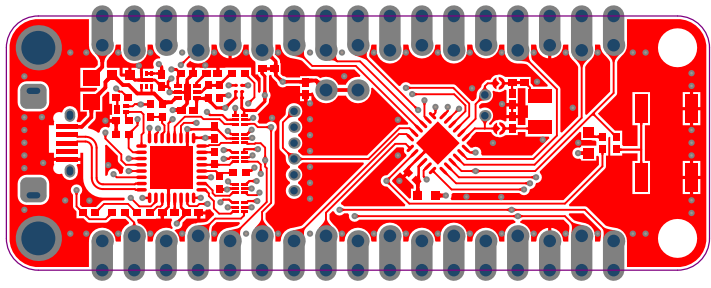
CONNECTIONS

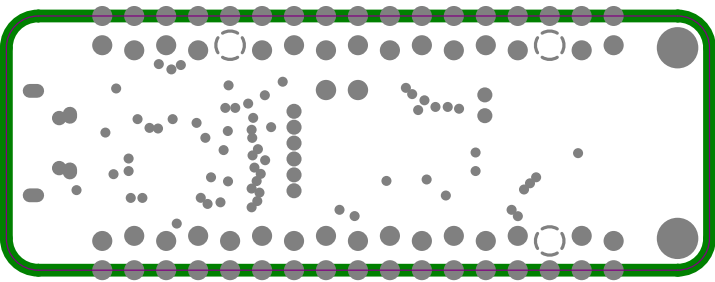


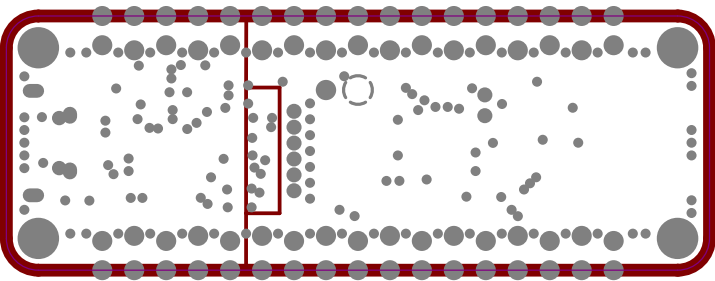
● GND  
● BOOT

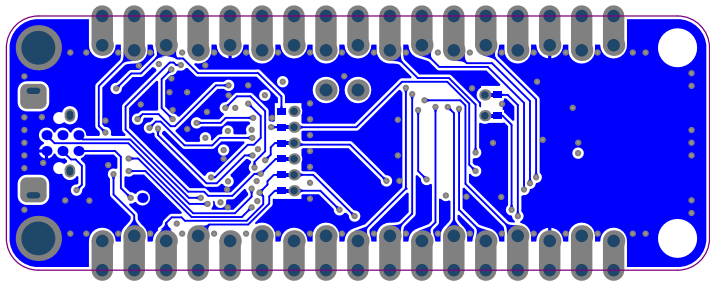
CDC











# Component list

Bill of Materials Fitted for Variant [Default Assembly] of Project [ATtiny3217 Curiosity Nano.PrjPcb] (No PCB Document Selected)

Source Data From:

ATtiny3217 Curiosity Nano.PrjPcb

Project:

ATtiny3217 Curiosity Nano.PrjPcb

Variant:

Default Assembly

Report Date: 2/20/2020 1:43 PM  
Print Date:



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)=0.20Ohm, Max current=1A
Fitted	LABEL1	1	Label PCBA	ACT Logimark AS	505462	PCBA identification label PP Top White Gloss
Fitted	PCB1	1	ATtiny3217 Curiosity Nano PCB Documentation			ATtiny3217 Curiosity Nano PCB Documentation
Fitted	PCBDOC1	1	ATtiny3217 Curiosity Nano PCBA Documentation			ATtiny3217 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	RC0402FR-0727KL	Thick film resistor, SMD 0402, 1/16W, 1%
Fitted	R106	1	33k	ASJ Holdings	CR10-3302-FK	Thick film resistor, SMD 0402, 1/16W, 1%
Fitted	R107, R108, R110, R112, R202, R203	6	1k	ASJ Holdings	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	ATtiny3217 Curiosity Nano Test			Fixture Test for ATtiny3217 Curiosity Nano
Fitted	TESTDOC1	1	Curiosity Nano Test Instructions			Generic Test Instructions for Curiosity Nano
Fitted	U100	1	SAMD21E18A-MUT	Microchip	ATSAMD21E18A-MUT	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, 1.6x1.6mmMLF
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	MIC94163YCS-TR	Loadswitch, Rds(on) = 14.5mohm, 1.0mm x 1.5mm WLCSP, reverse blocking
Fitted	U200	1	ATtiny3217-MFR	Microchip	ATTINY3217-MFR	8-bit RISC MCU
Not Fitted	C203	0	10p	AVX	04025A100JA T2A	Ceramic capacitor, SMD 0402, NP0, 50V, +/-5%
Not Fitted	C204	0	13pF	Murata	GRM1555C1H130JA01D	Ceramic capacitor, SMD 0402, NP0, 50V, +/-5%
Not Fitted	XC200	0	32.768kHz	Abracon	ABS07-32.768kHz-7-T	Crystal, 32.768kHz, CL=7.0pF, ESR=70kOhm, SMD LxW=3.2 x 1.5mm, 20ppm

Approved		48	Notes			