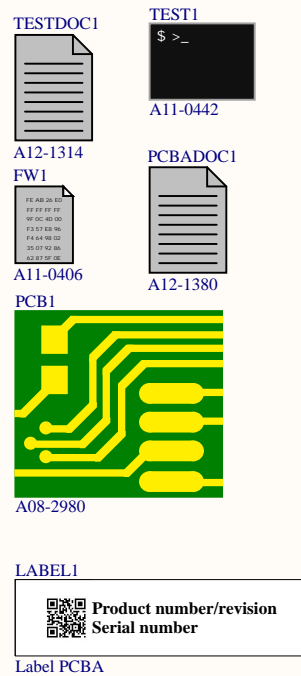
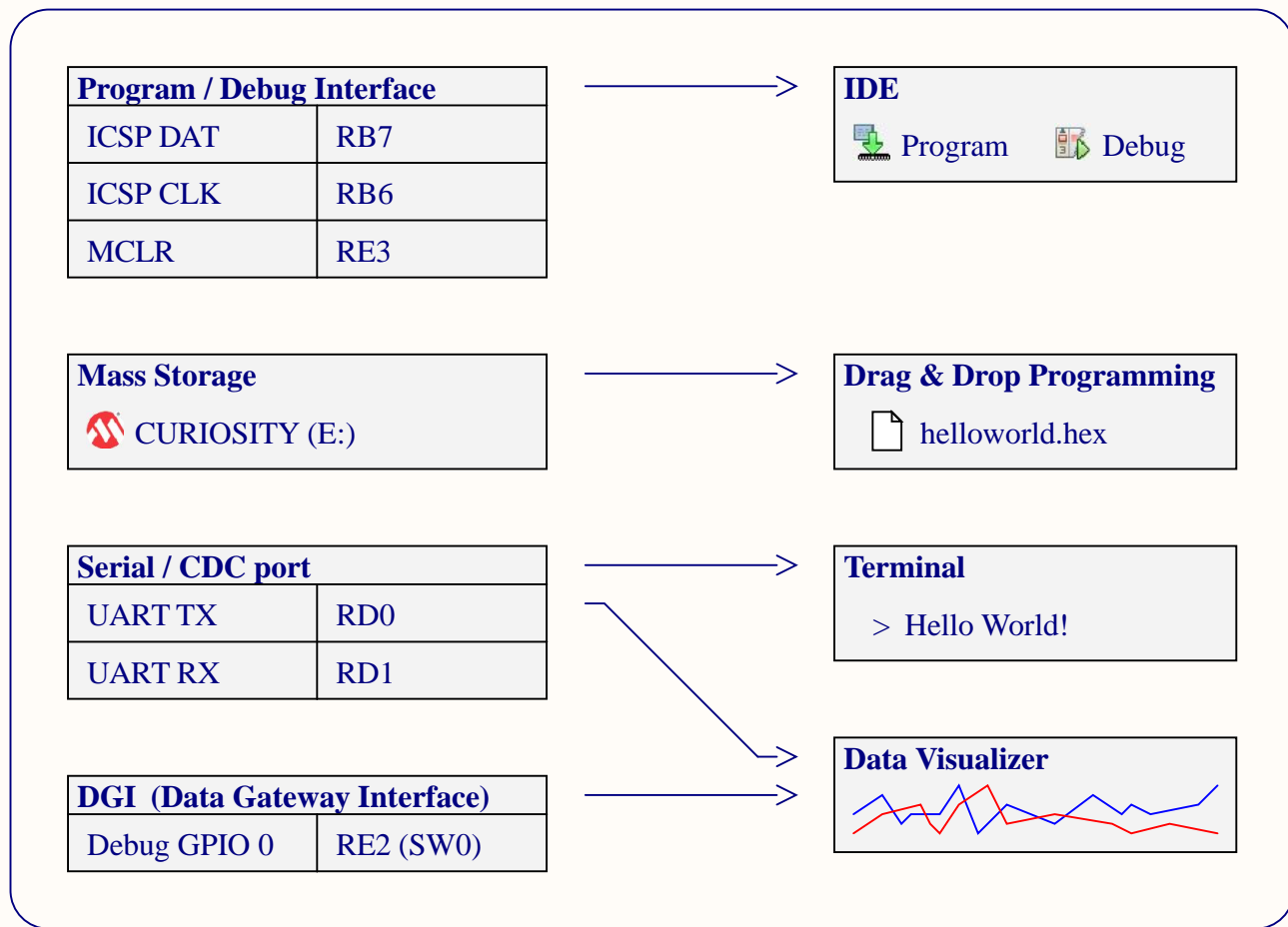
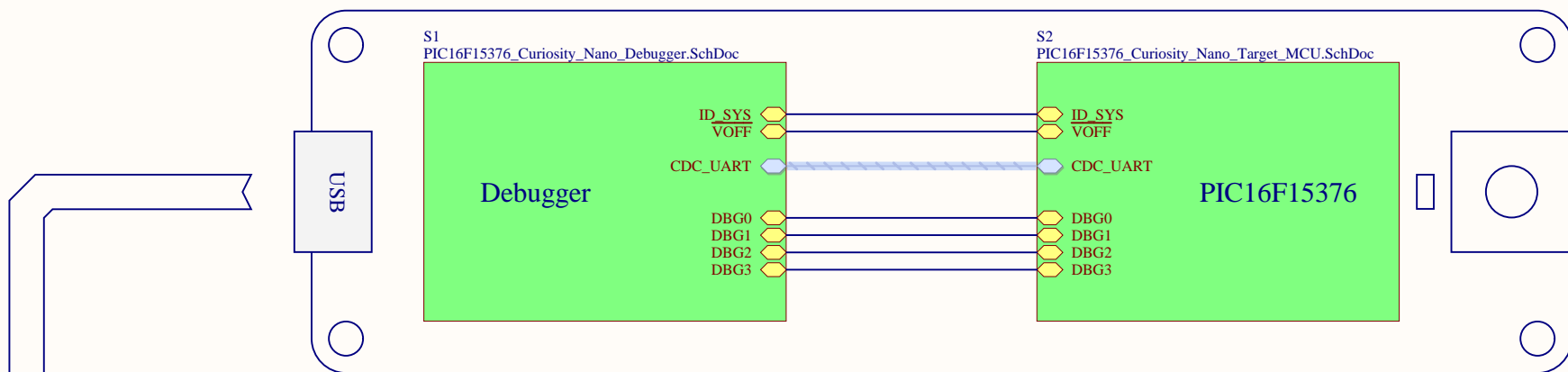


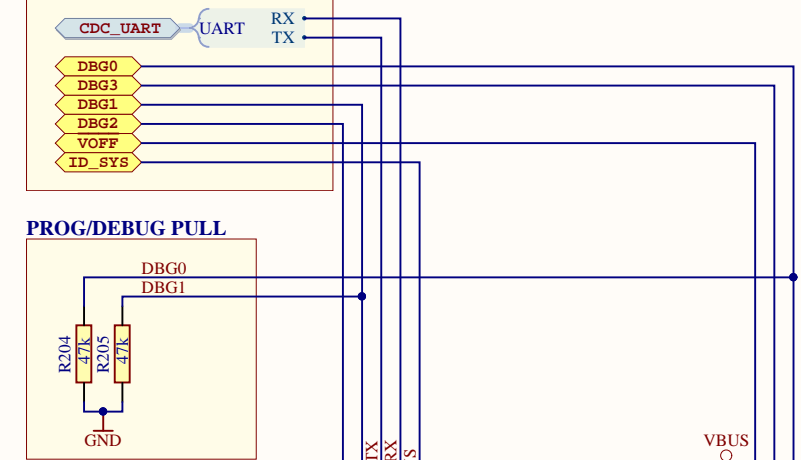
# PIC16F15376 Curiosity Nano



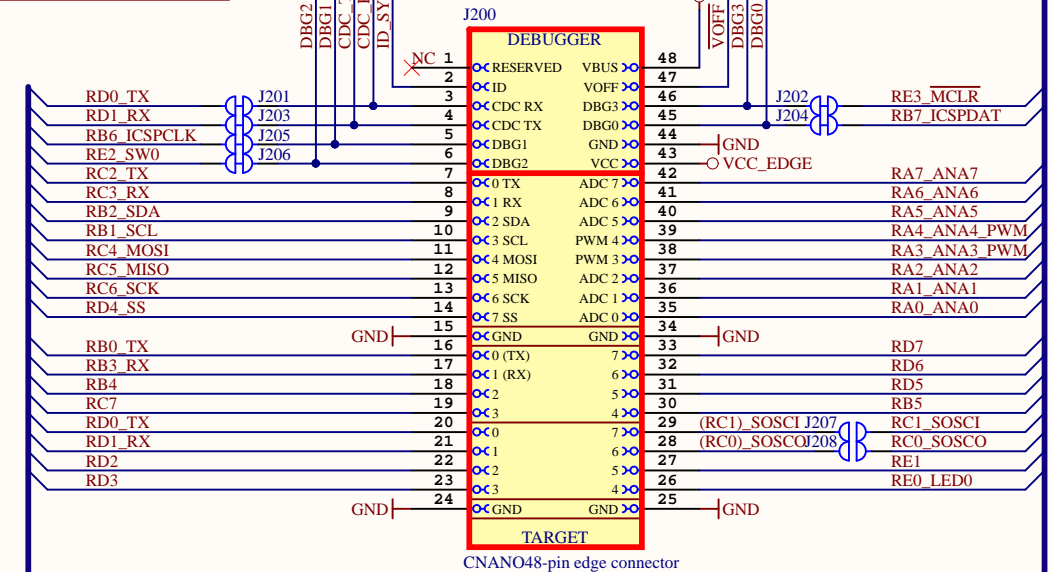
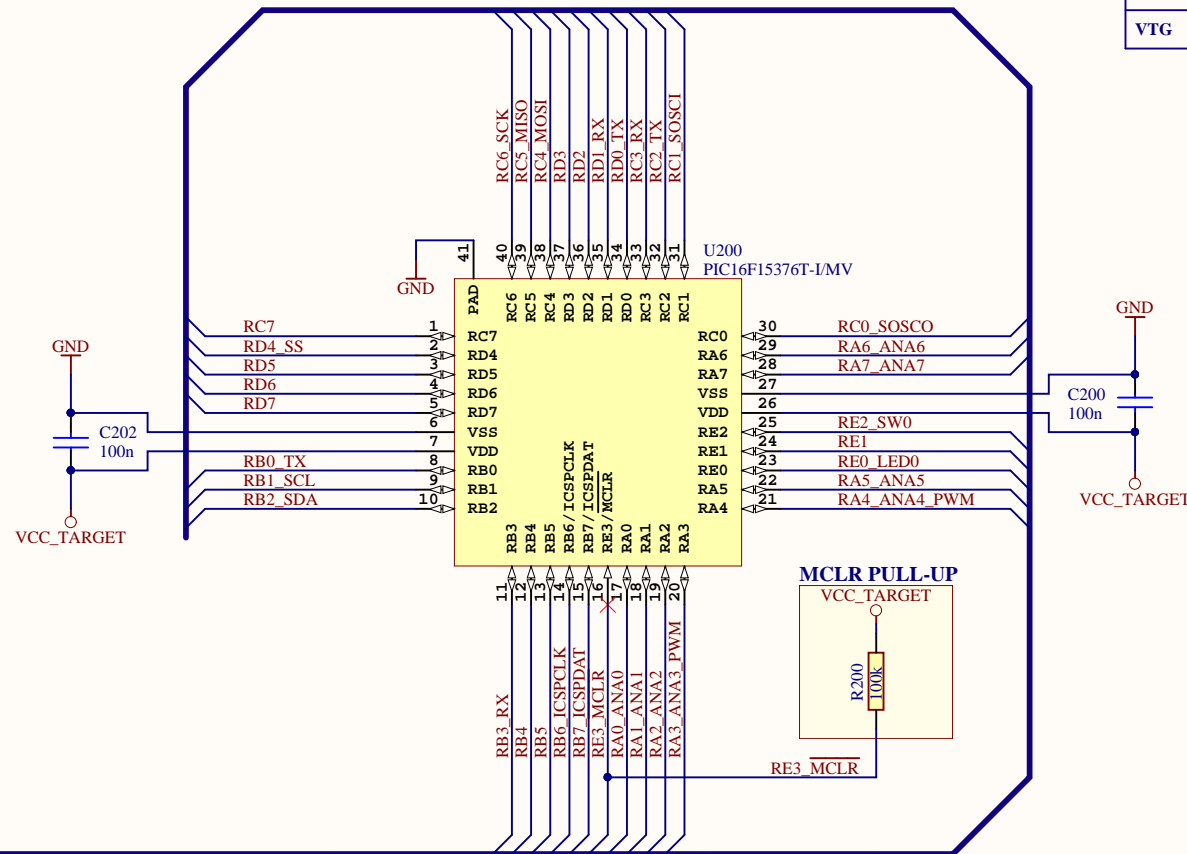
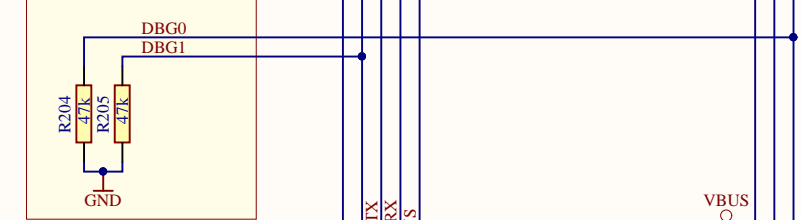
# PIC16F15376

PIC16F15376		
Debugger	Name	Pin
CDC TX	UART RX	RD1
CDC RX	UART TX	RD0
DBG0	ICSPDAT	RB7
DBG1	ICSPCLK	RB6
DBG2	GPIO0	RE2
DBG3	MCLR	RE3
VTG	2.3V - 5.5V	

## DEBUGGER CONNECTIONS



## PROG/DEBUG PULL



**NOTE on UART/CDC:**

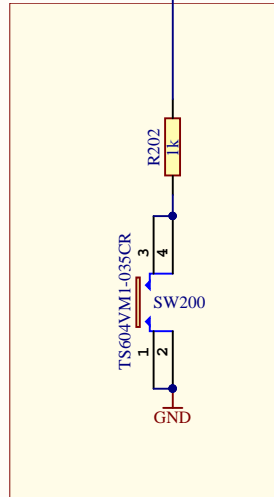
RX/TX on the header denotes the input/output direction of the signal respective to it's source.

CDC TX is output from the on-board debugger.  
CDC RX is input to the on-board debugger.  
TX is output from the TARGET device.  
RX is input to the TARGET device.

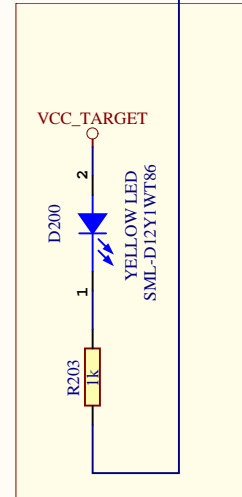
**NOTE on I2C:**

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

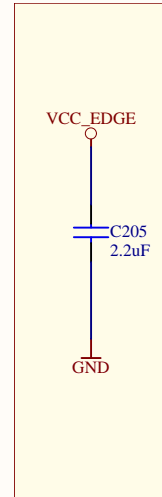
## USER BUTTON



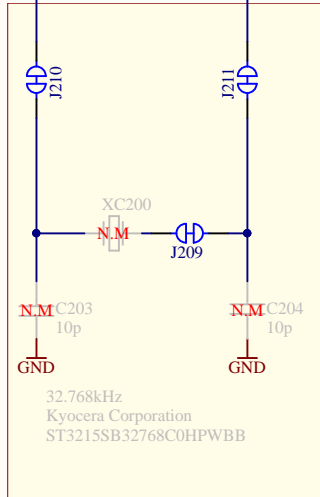
## USER LED



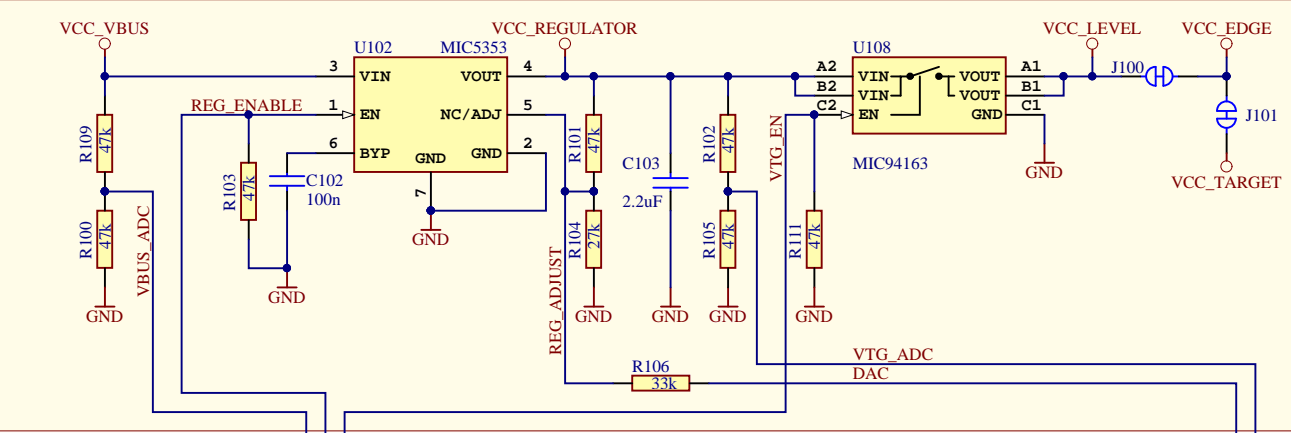
## TARGET BULK



## 32kHz CRYSTAL



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 volatage 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.

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

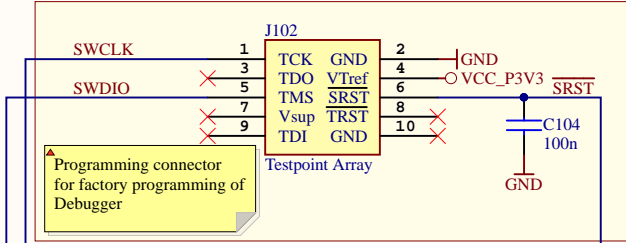
MIC5353:  
Vin: 2.6V to 6V  
Vout: 1.25V to 5.1V  
Imax: 500mA  
Dropout (typical): 50mV@150mA, 160mV @ 500mA  
Accuracy: 2% initial  
Thermal shutdown and current limit

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

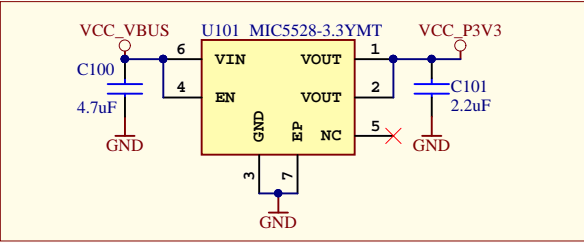
Interface	ICSP	UPDI
Signal	TARGET	TARGET
CDC TX	UART RX	UART RX
CDC RX	UART TX	UART TX
DBG0	DAT	UPDI
DBG1	CLK	GPIO
DBG2	GPIO	GPIO
DBG3	MCLR	RESET
VCC	-	-

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

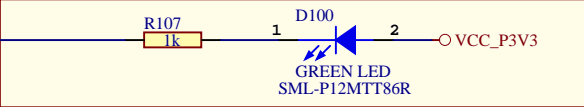
DEBUGGER TESTPOINTS



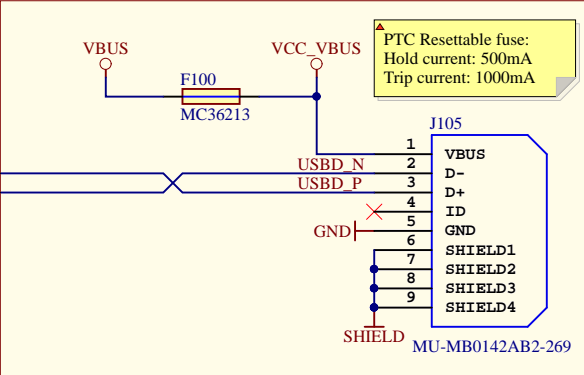
DEBUGGER REGULATOR



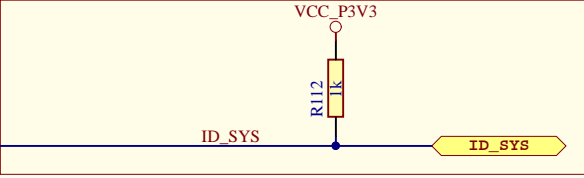
DEBUGGER POWER/STATUS LED



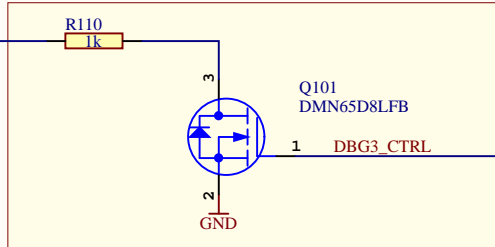
DEBUGGER USB MICRO-B CONNECTOR



ID PIN



DBG3 OPEN DRAIN



Drawn By:  
Microchip Norway  
Engineer:  
TF, HN

**MICROCHIP**

Project Title  
**PIC16F15376 Curiosity Nano**  
Sheet Title  
**Debugger**

Size A3  
PCB Assembly Number: A09-3251  
PCB Number: A08-2980  
File: PIC16F15376\_Curiosity\_Nano\_Debugger.SchDoc

PCBA Revision: 2  
PCB Revision: 2  
Page: 3 of 4

Designed with  
**Altium**  
Altium.com  
Date: 9/24/2019

# 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.

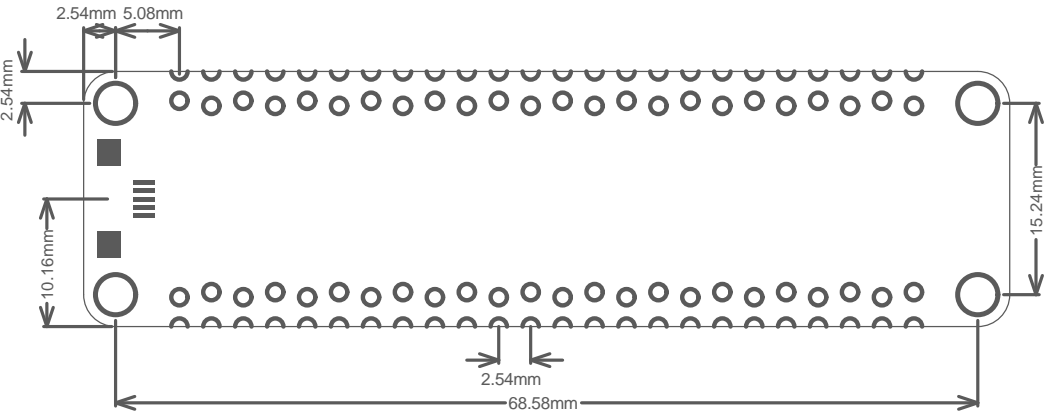
PCB:

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

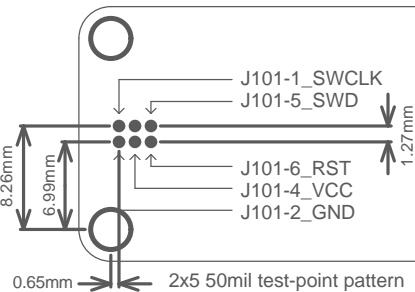


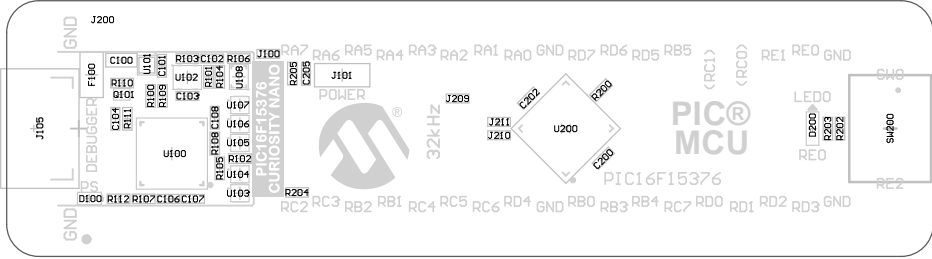
# Connector Placement

The diagram illustrates the placement of connectors on a board. It shows two rows of circular connectors. The top row has a 4mm pitch between the first two connectors, followed by a 5.08mm pitch. The bottom row has a 2.54mm pitch between the first two connectors. The total width of the connector array is 68.58mm. The diagram also shows a series of small squares and rectangles along the left edge, representing other components or features.



# Test Point Placement







A08-2980 Rev2  
Microchip © 2019

LABEL1

GND RE0 RE1

<RC0>

<RC1>

RB5 RD5 RD6 RD7 GND RA0 RA1 RA2 RA3 RA4 RA5 RA6 RA7 V<sub>TTG</sub> GND

J208 RCO  
J207 RC1



TARGET

RE3	J202	D3
RE2	J206	D2
RB6	J205	D1
RB7	J204	D0
RD0	J201	RX CDC
RD1	J203	TX CDC

DEBUGGER

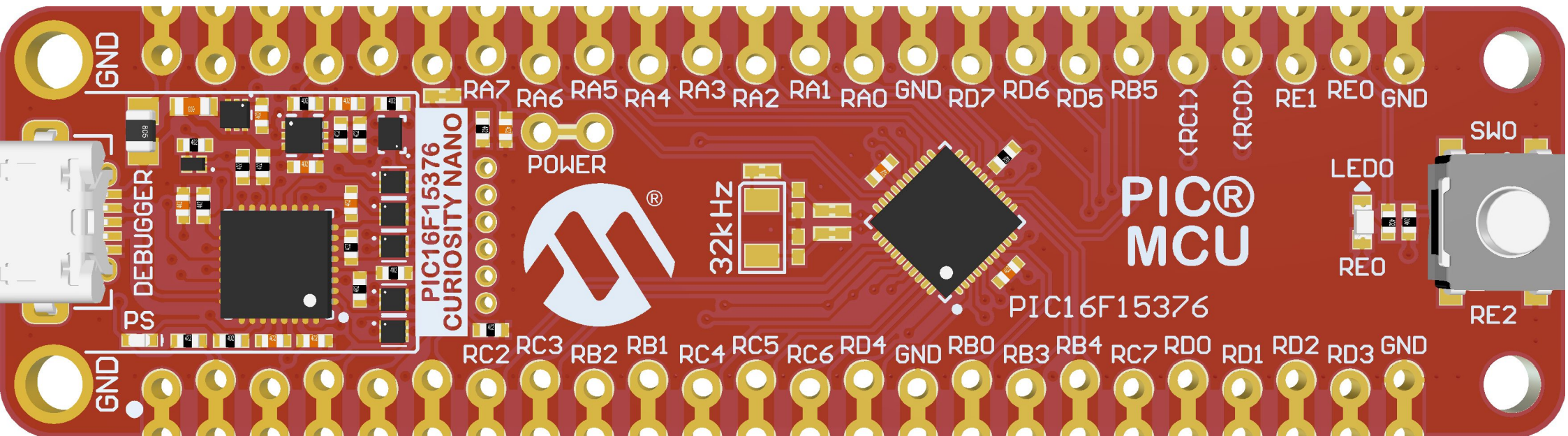


GND RD3 RD2 RD1 RD0 RC7 RB4 RB3 RB0 GND RD4 RC6 RC5 RC4 RB1 RB2 RC3 RC2 D2 D1 TX RX ID NC

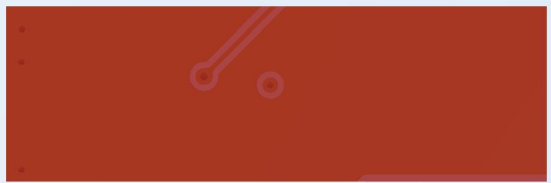
GND

J102

GND



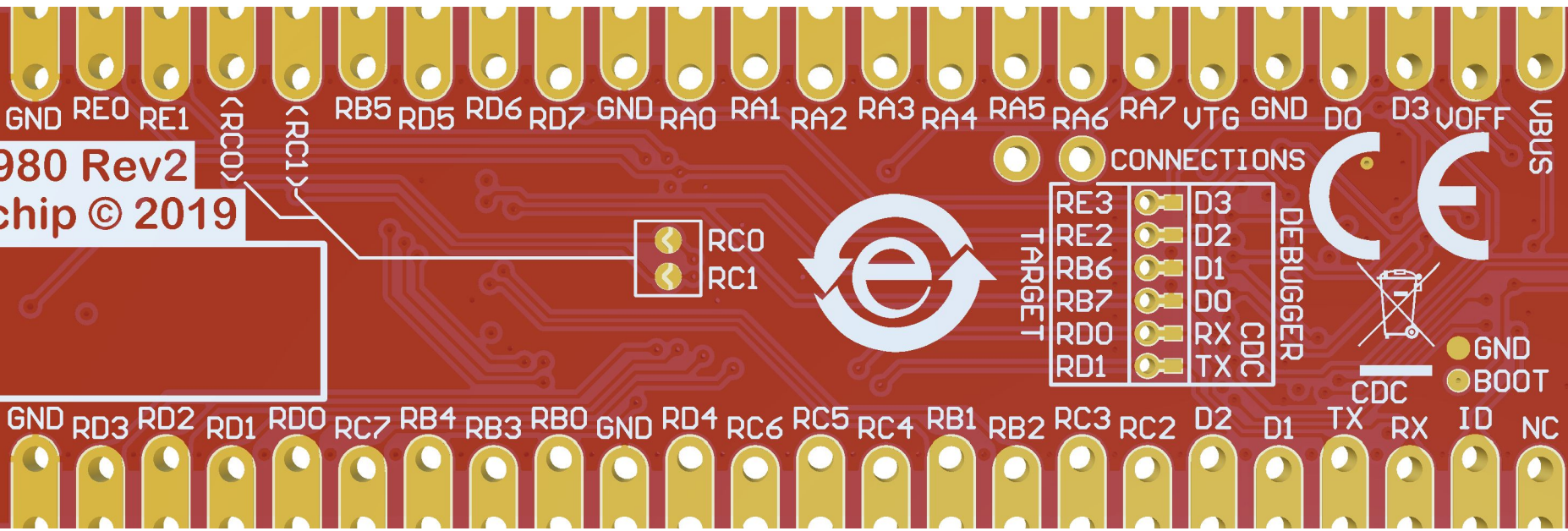
A08-2980 Rev2  
Microchip © 2019

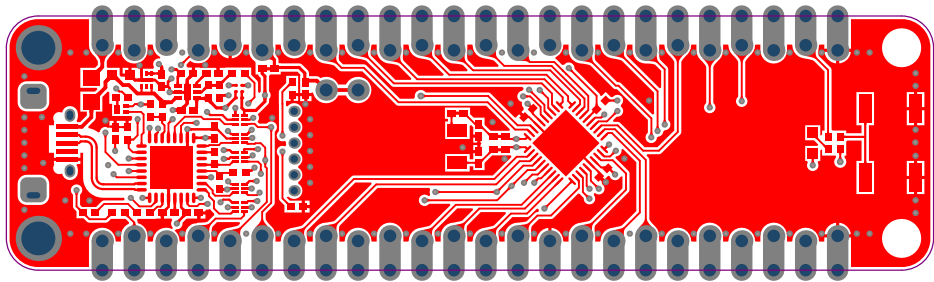


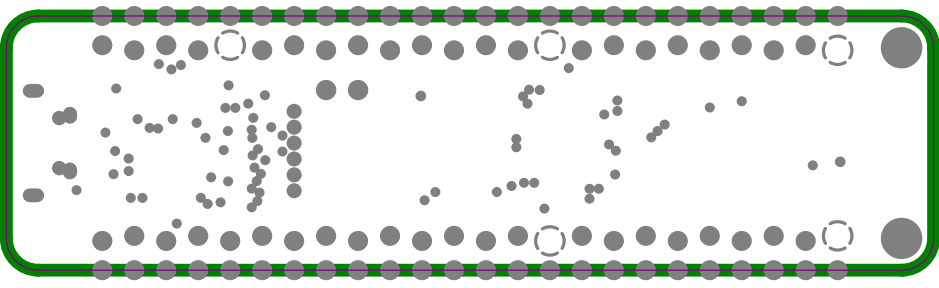
CONNECTIONS			
TARGET	RE3	D3	CDC DEBUGGER
	RE2	D2	
	RB6	D1	
	RB7	D0	
	RD0	RX	
	RD1	TX	

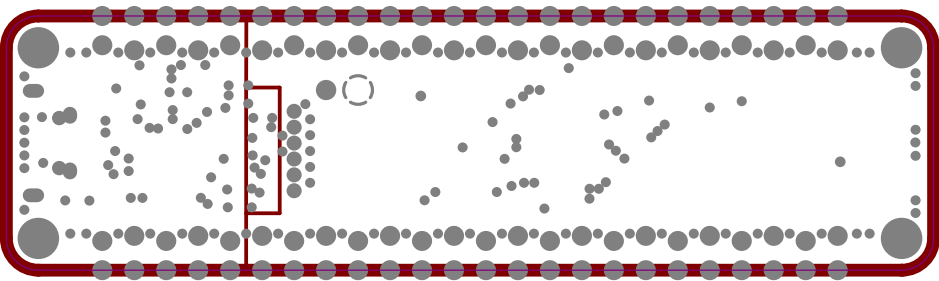


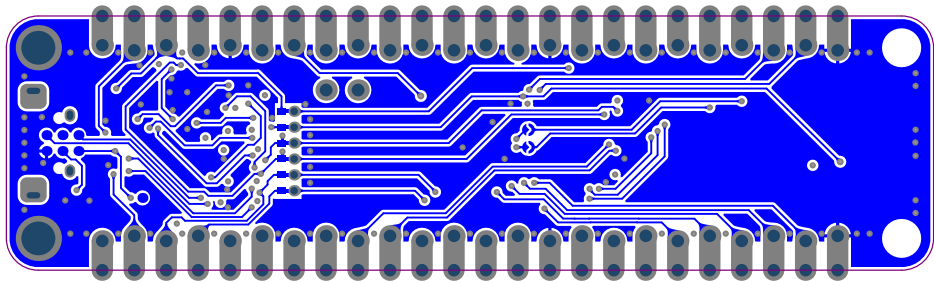
GND  
BOOT











# Component list

Bill of Materials Fitted for Variant [Default Assembly] of Project [PIC16F15376\_Curiosity\_Nano.PrjPcb] (No PCB Document Selected)

Source Data From:

PIC16F15376\_Curiosity\_Nano.PrjPcb

Project:

PIC16F15376\_Curiosity\_Nano.PrjPcb

Variant:

Default Assembly



Report Date: 9/24/2019 8:44 AM  
Print Date: 9/24/2019 8:44:24 AM

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, C104, C107, C108, C200, C202	6	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 firmware			nEDBG firmware
Fitted	J105	1	MU-MB0142AB2-269	Allen Creations Corp.	MU-MB0142AB2-269	USB micro AB, Surface mount signals and DIP shield
Fitted	LABEL1	1	Label PCBA	ACT Logimark AS	505462	PCBA identification label PP Top White Gloss
Fitted	PCB1	1	PIC16F15376 Curiosity Nano PCB Documentation			PIC16F15376 Curiosity Nano PCB Documentation
Fitted	PCBADOC1	1	A09-3251 PCBA files			PIC16F15376 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, R204, R205	9	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	R200	1	100k	ASJ	CR10-1003-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	PIC16F15376 Curiosity Nano test			Fixture test for PIC16F15376 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	PIC16F15376T-IMV	Microchip Technology Inc	PIC16F15376T-IMV	PIC16F15376 Microcontroller, 40 pin UQFN 5mm x 5mm 0.5mm
Not Fitted	C203, C204	0	10p	AVX	04025A100JAT2A	Ceramic capacitor, SMD 0402, NP0, 50V, +/-5%
Not	XC200	0	32.768kHz	Kyocera Corporation	ST3215SB32768C0HPWBB	Kyocera ST3215SB32768C0HPWBB, 32.768kHz, 7pF, SMD tuning fork crystal

Approved

Notes