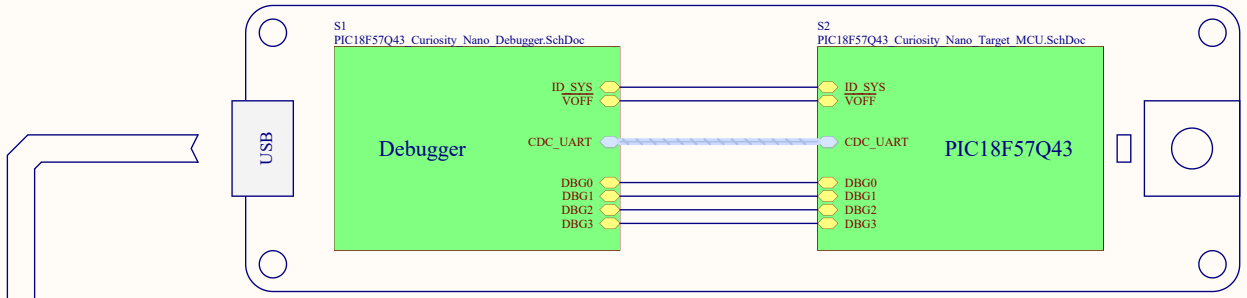
PIC18F57Q43 Curiosity Nano



On-Board Peripherals		
LED0	RF3	Active Low
SW0	RB4	Active Low

Program / Debug Interface	
ICSP DAT	RB7
ICSP CLK	RB6
MCLR	RE3

IDE
Program Debug

Mass Storage
CURIOSITY (E:)

Drag & Drop Programming
helloworld.hex

Serial / CDC port	
UART[1/3/5]* TX	RF0
UART[1/3/5]* RX	RF1

*configure with Peripheral Pin Select (PPS)

Terminal
> Hello World!

DGI (Data Gateway Interface)	
Debug GPIO 0	RB4 (SW0)

Data Visualizer

S3
PIC18F57Q43_Curiosity_Nano_Revision_History.SchDoc

TESTDOC1
A12-1314

TEST1
A11-0457

PCB1
A08-3021

FW1
A11-0406

PCBADOC1
A12-1400

LABEL1
Product number/revision
Serial number
Label PCBA

Drawn By: TF, PB
Engineer: TF

MICROCHIP

Project Title: *PIC18F57Q43 Curiosity Nano*
Sheet Title: Top Level
Size: A3
PCB Assembly Number: A09-3290 PCBA Revision: 3
PCB Number: A08-3021 PCB Revision: 3
File: PIC18F57Q43_Curiosity_Nano_TopLevel.SchDoc
Date: 26.10.2020
Page: 1 of 4

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Altium.com

PIC18F57Q43

PIC18F47Q43		
Debugger	*Name*	*Pin*
CDC TX	UART[1/3/5] RX	RF1
CDC RX	UART[1/3/5] TX	RF0
DBG0	ICSPDAT	RB7
DBG1	ICSPCLK	RB6
DBG2	GPIO0	RB4
DBG3	$\overline{\text{MCLR}}$	RE3
VTG	1.8V - 5.5V	

DEBUGGER CONNECTIONS

CDC_UART — UART — RX, TX

DBG0, DBG3, DBG1, DBG2, VOFF, ID_SYS

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

PROG/DEBUG PULL

DBG1 — R205 47K — R204 47K — DBG0

GND

J200 DEBUGGER

	1	RESERVED	VBUS	56	
	2	ID	VOFF	55	
RF0_UART5_TX	3	CDC RX	DBG3	54	RE3_$\overline{\text{MCLR}}$
RF1_UART5_RX	4	CDC TX	DBG0	53	RB7_ICSPDAT
RB6_ICSPCLK	5	DBG1	GND	52	GND
RB4_SW0	6	DBG2	VCC	51	VCC_EDGE
RC2_UART1_TX	7	0 TX	ADC 7	50	RA7_ANA7
RC3_UART1_RX	8	1 RX	ADC 6	49	RA6_ANA6
RB2_I2C1_SDA	9	2 SDA	ADC 5	48	RA5_ANA5
RB1_I2C1_SCL	10	3 SCL	PWM 4	47	RB3_ANA4_PWM
RC4_SPI1_MOSI	11	4 MOSI	PWM 3	46	RB0_ANA3_PWM
RC5_SPI1_MISO	12	5 MISO	ADC 2	45	RA2_ANA2
RC6_SPI1_SCK	13	6 SCK	ADC 1	44	RA1_ANA1
RD4_SPI1_SS	14	7 SS	ADC 0	43	RA0_ANA0
GND	15	GND	GND	42	GND
RA3_UART3_TX	16	0 (TX)	7	41	RD7
RA4_UART3_RX	17	1 (RX)	6	40	RD6
RE2	18	2	5	39	RD5
RC7	19	3	4	38	RB5
RD0_UART4_TX	20	0	7	37	RF7
RD1_UART4_RX	21	1	6	36	RF6
RD2	22	2	5	35	RF5
RD3	23	3	4	34	RF4
GND	24	GND	GND	33	GND
RF0_UART5_TX	25	0	7	32	RE1
RF1_UART5_RX	26	1	6	31	RE0
RF2	27	2	5	30	RC1 J207 RC1_SOSCI
RF3_LED0	28	3	4	29	RC0 J208 RC0_SOSCO

TARGET

CNANO56-pin edge connector

J201 RF0_UART5_TX; J203 RF1_UART5_RX; J205 RB6_ICSPCLK; J206 RB4_SW0

J202 RE3_$\overline{\text{MCLR}}$; J204 RB7_ICSPDAT

NOTE on I2C:

No pull-ups on board. Pull-ups should be mounted close to I2C client(s).

U200 PIC18F57Q43T-I/PT

RC7	1	RC7	RF0	36	RF0_UART5_TX
RD4_SPI1_SS	2	RD4	SOSCIN/RC1	35	RC1_SOSCI
RD5	3	RD5	SOSCO/RC0	34	RC0_SOSCO
RD6	4	RD6	CLKOUT/OSC2/RA6	33	RA6_ANA6
RD7	5	RD7	CLKIN/OSC1/RA7	32	RA7_ANA7
	6	VSS	VSS	31	
	7	VDD	VDD	30	
RB0_ANA3_PWM	8	RB0	RE2	29	RE2
RB1_I2C1_SCL	9	RB1	RE1	28	RE1
RB2_I2C1_SDA	10	RB2	RE0	27	RE0
RB3_ANA4_PWM	11	RB3	RA5	26	RA5_ANA5
RF4	12	RF4	RA4	25	RA4_UART3_RX
RF5	13	RF5	RA3	24	RA3_UART3_TX
RF6	14	RF6	RA2	23	RA2_ANA2
RF7	15	RF7	RA1	22	RA1_ANA1
RB4_SW0	16	RB4	RA0	21	RA0_ANA0
RB5	17	RB5	RB7/ICSPDAT	20	RB7_ICSPDAT
RB6_ICSPCLK	18	RB6/ICSPCLK	RB3/MCLR/VPP	19	RE3_$\overline{\text{MCLR}}$

GND — C202 100n — VCC_TARGET

GND — C200 100n — VCC_TARGET

MCLR PULL-UP

VCC_TARGET — R200 47K — RE3_$\overline{\text{MCLR}}$

USER BUTTON

RB4_SW0 — R202 1K — SW200 TS604VM1-035CR — GND

USER LED

RF3_LED0 — R203 1K — D200 YELLOW LED SML-D12Y1WT86 — VCC_TARGET

TARGET BULK

VCC_EDGE — C205 2.2uF — GND

32kHz CRYSTAL

RC1_SOSCI — J210 — XC200 N.M 32.768 kHz — J209 — C203 N.M 8.2p — GND

RC0_SOSCO — J211 — C204 N.M 8.2p — GND

Drawn By: TF, PB			
Engineer: TF, PB			
Project Title: *PIC18F57Q43 Curiosity Nano*			
Sheet Title: Target MCU			
Size A3	PCB Assembly Number: A09-3290	PCBA Revision: 3	
	PCB Number: A08-3021	PCB Revision: 3	
File: PIC18F57Q43_Curiosity_Nano_Target_MCU.SchDoc			

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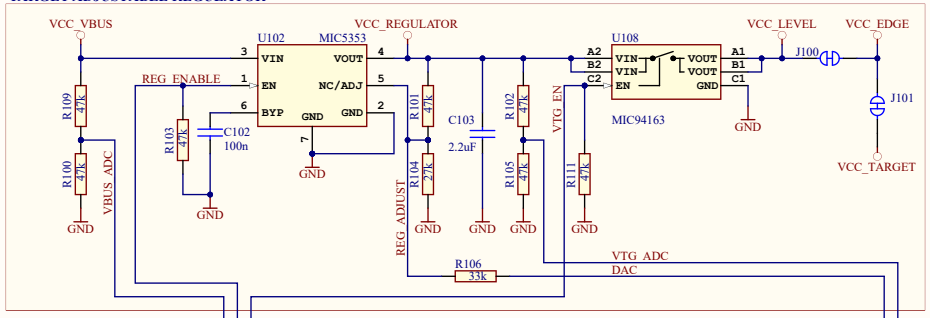
Date: 26.10.2020

Page: 2 of 4

TARGET ADJUSTABLE REGULATOR



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

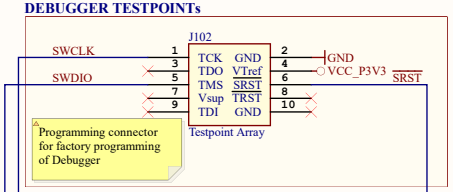
Maximum output voltage is limited by the input voltage and the dropout voltage in the regulator. (Vmax = Vin - dropout)

Signal \ Interface	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	MCLR	RESET
VCC	-	-

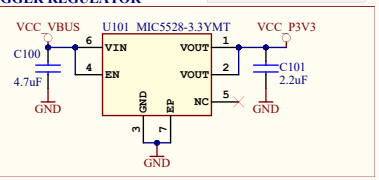
MIC5528:
Vin: 2.5V to 5.5V
Vout: Fixed 3.3V
Imax: 500mA
Dropout: 260mV @ 500mA

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 volatege 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.

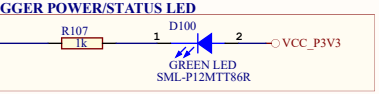
DEBUGGER TESTPOINTs



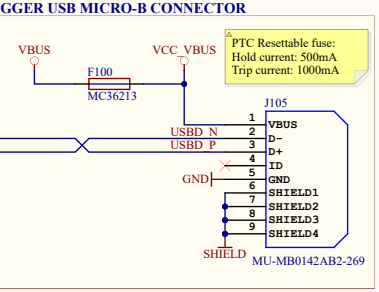
DEBUGGER REGULATOR



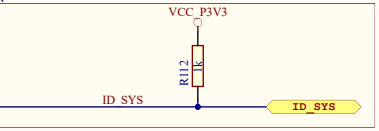
DEBUGGER POWER/STATUS LED

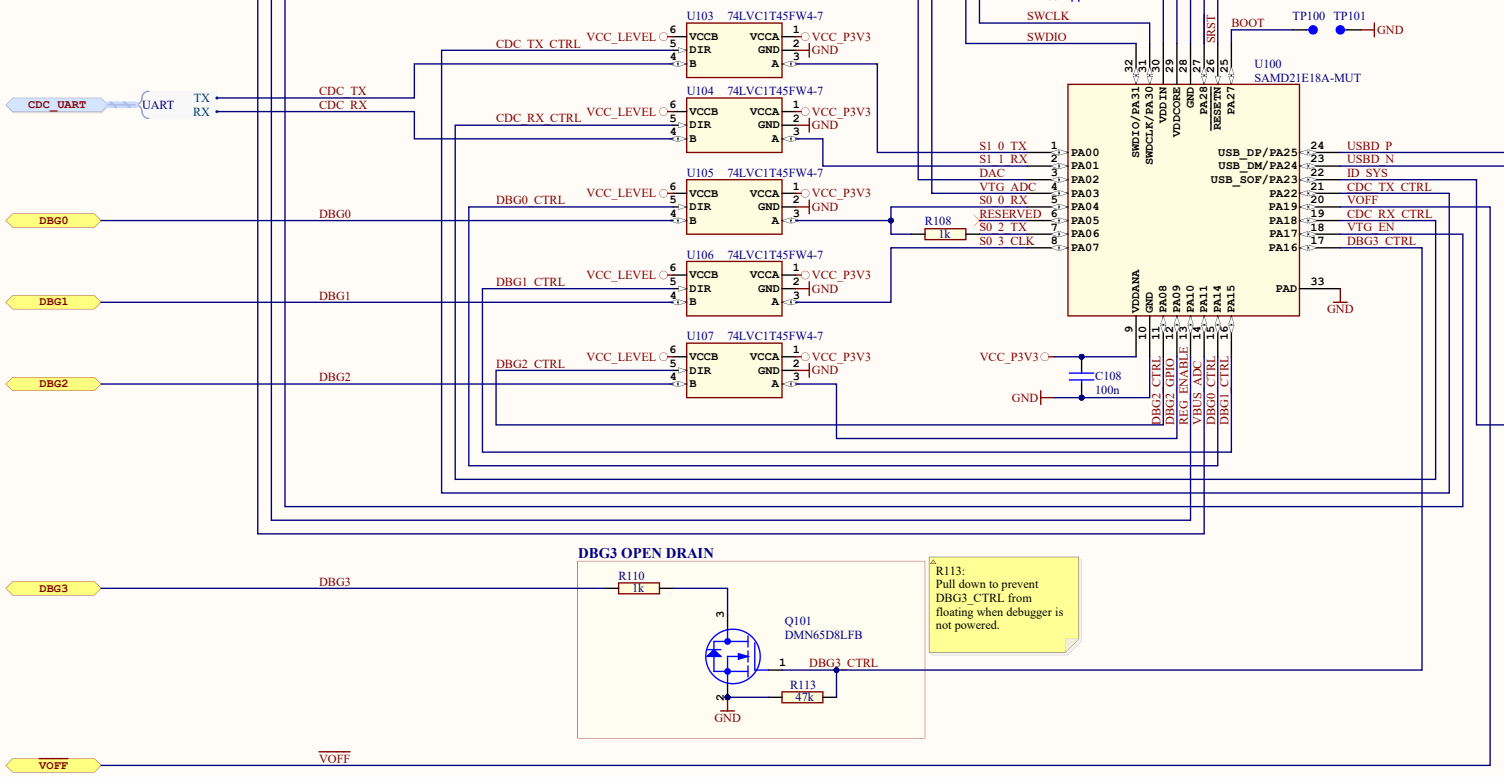


DEBUGGER USB MICRO-B CONNECTOR



ID PIN





DBG3 OPEN DRAIN

Drawn By:	TF
Engineer:	TF
Project Title	PIC18F57Q43 Curiosity Nano
Sheet Title	Debugger
Size	A3
PCB Assembly Number:	A09-3290
PCBA Revision:	3
PCB Number:	A08-3021
PCB Revision:	3
Date:	26.10.2020
File:	PIC18F57Q43_Curiosity_Nano_Debugger.SchDoc
Page:	3 of 4

MICROCHIP

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Revision History

PCB Assembly Rev 1:

Design Changes:

Initial Design

PCB:

PCB revision 1

PCB Assembly Rev 2:

Design Changes:

Board edge connector updated to staggered and current measurement footprint added. Added pull-down on gate of reset MOSFET (Q100), and removed decoupling from SAMD21 reset line.Changed Target reset pull-up value from 100k to 47k to ease production.

PCB:

PCB revision 2

PCB Assembly Rev 3:

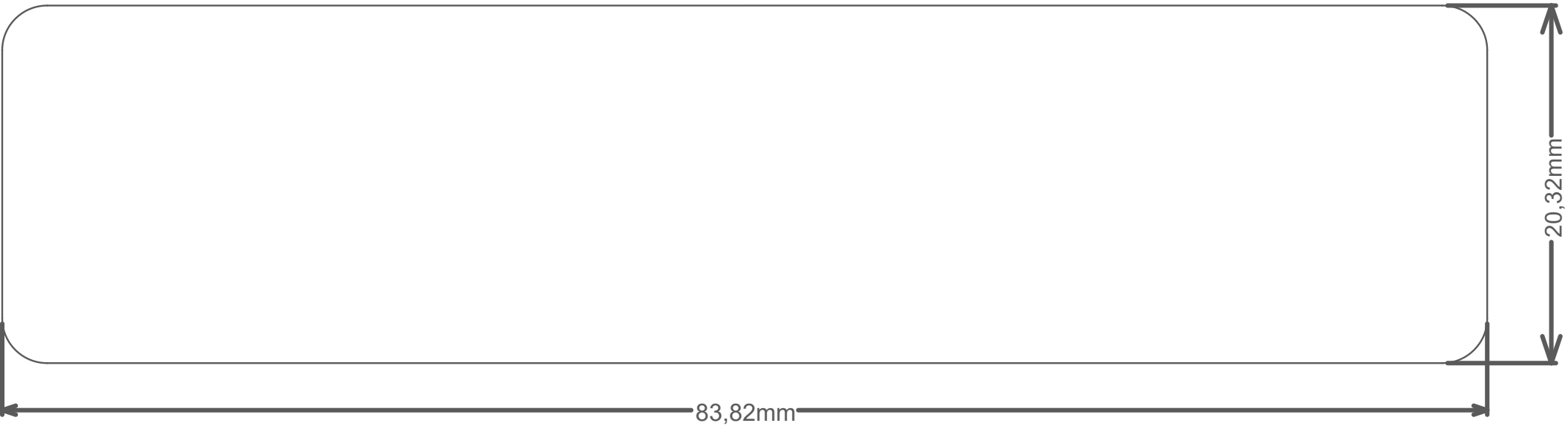
Design Changes:

Changed pinout of the edge connector
Changed default crystal (XC200) to available type.

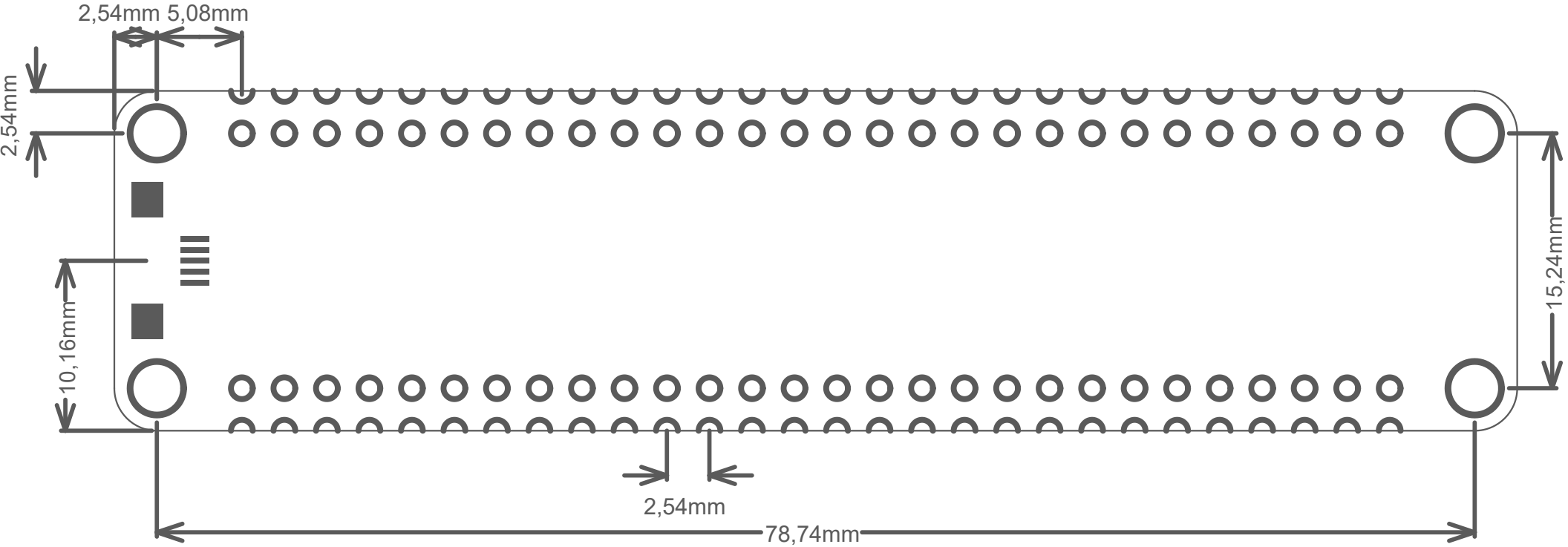
PCB:

PCB revision 3

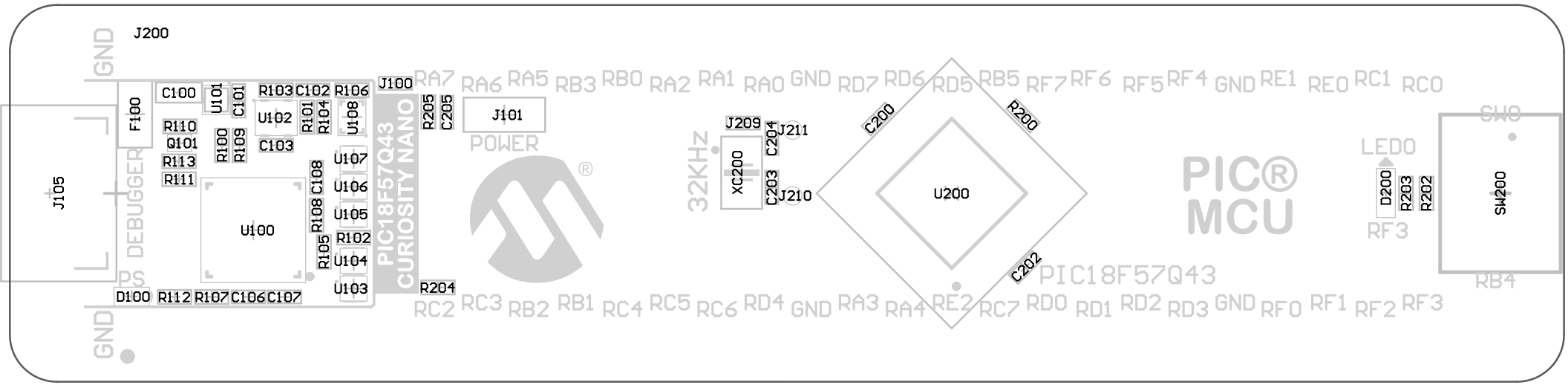
Drawn By: TF			
Engineer: TF			
Project Title: *PIC18F57Q43 Curiosity Nano*			Designed with Altium — Altium.com
Sheet Title: Revision History			
Size A3	PCB Assembly Number: A09-3290	PCBA Revision: 3	Date: 26.10.2020
	PCB Number: A08-3021	PCB Revision: 3	Page: 4 of 4
File: PIC18F57Q43_Curiosity_Nano_Revision_History.SchDoc			

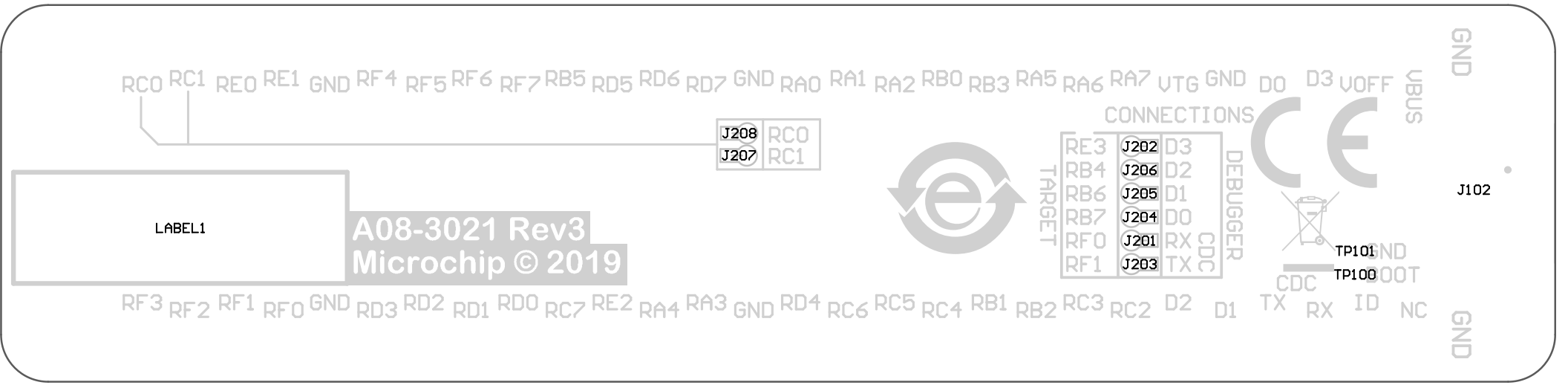

20,32mm
83,82mm

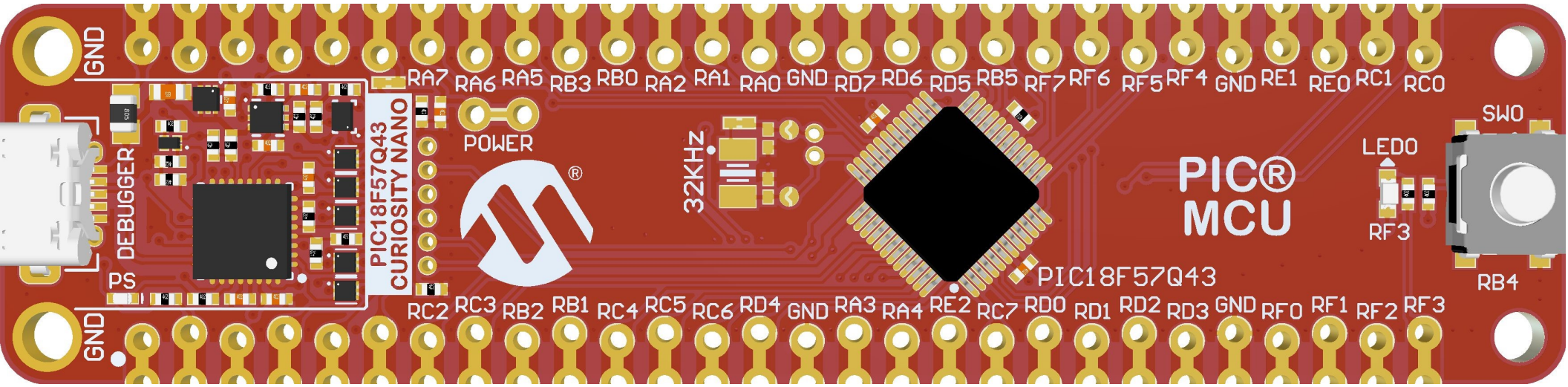
Connector Placement

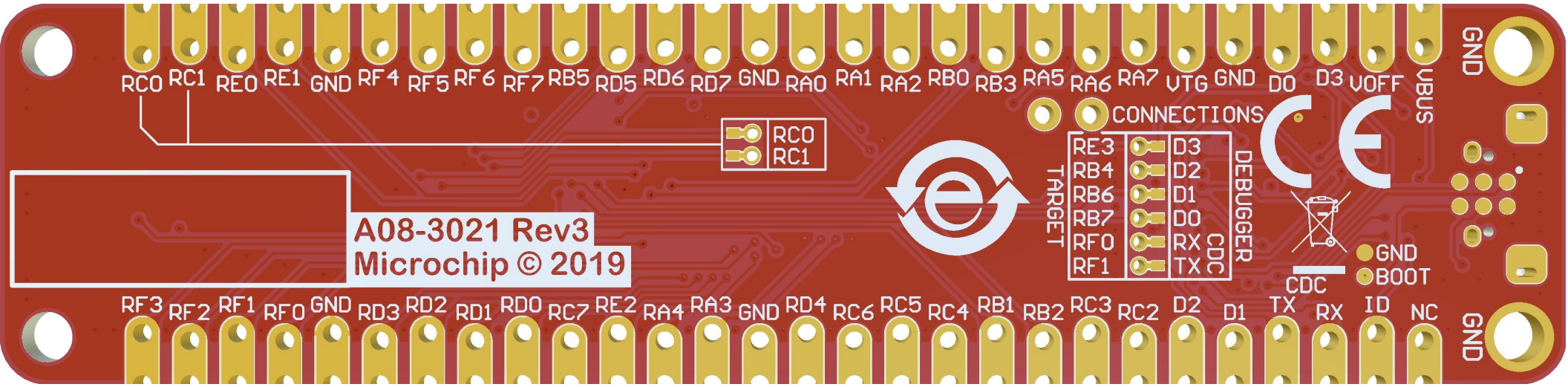


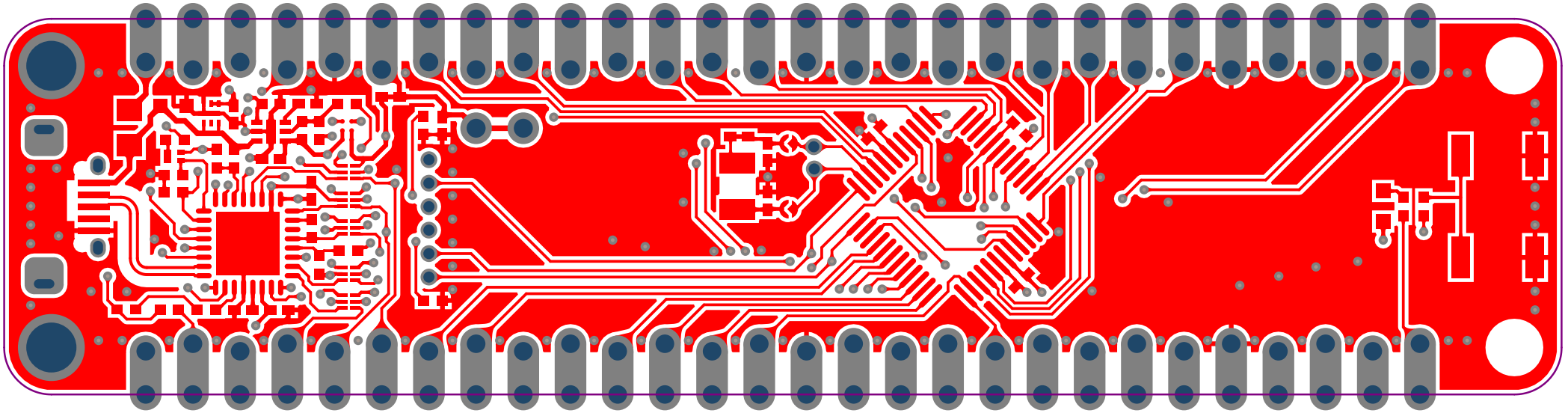
Test Point Placement

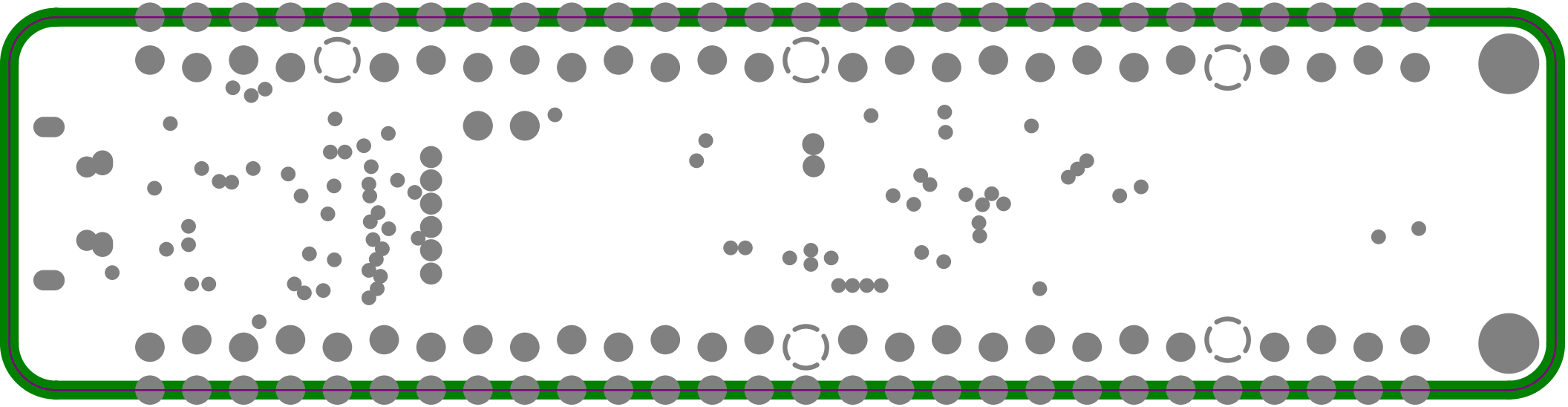

J200
GND
F100
C100
U101
C101
R103
C102
R106
J100
R110
Q101
R113
R111
U102
R101
R104
U108
R205
C205
J101
POWER
R100
R109
C103
U107
U106
U105
R102
U104
U103
R204
DEBUGGER
PS
J105
U100
R108
C108
R105
D100
R112
R107
C106
C107
PIC18F57Q43
CURIOSITY NANO
RA7 RA6 RA5 RB3 RB0 RA2 RA1 RA0 GND RD7 RD6 RD5 RB5 RF7 RF6 RF5 RF4 GND RE1 RE0 RC1 RC0
RC2 RC3 RB2 RB1 RC4 RC5 RC6 RD4 GND RA3 RA4 RE2 RC7 RD0 RD1 RD2 RD3 GND RF0 RF1 RF2 RF3
32KHz
J209
XC200
C203
C204
J211
J210
C200
R200
U200
C202
PIC18F57Q43
PIC®
MCU
LED0
D200
R203
R202
RF3
SW0
SW200
RB4

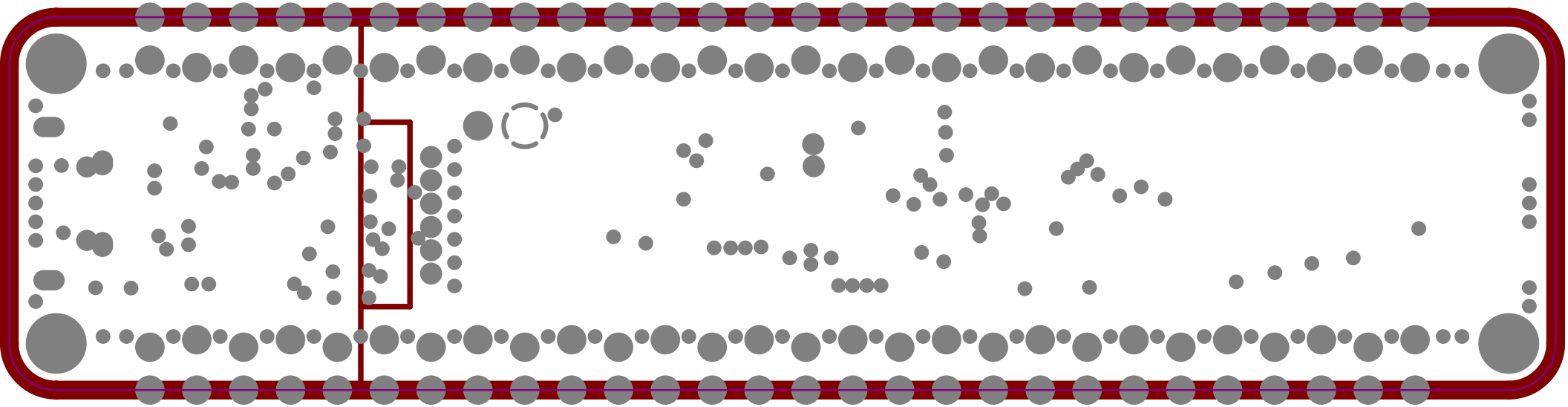

RC0 RC1 RE0 RE1 GND RF4 RF5 RF6 RF7 RB5 RD5 RD6 RD7 GND RA0 RA1 RA2 RB0 RB3 RA5 RA6 RA7 VTG GND D0 D3 VOFF VBUS GND
J208 RC0
J207 RC1
CONNECTIONS
RE3 J202 D3
RB4 J206 D2
RB6 J205 D1
RB7 J204 D0
RF0 J201 RX
RF1 J203 TX
TARGET
DEBUGGER
CDC
J102
LABEL1
A08-3021 Rev3
Microchip © 2019
TP101
TP100
GND
BOOT
CDC
RF3 RF2 RF1 RF0 GND RD3 RD2 RD1 RD0 RC7 RE2 RA4 RA3 GND RD4 RC6 RC5 RC4 RB1 RB2 RC3 RC2 D2 D1 TX RX ID NC GND

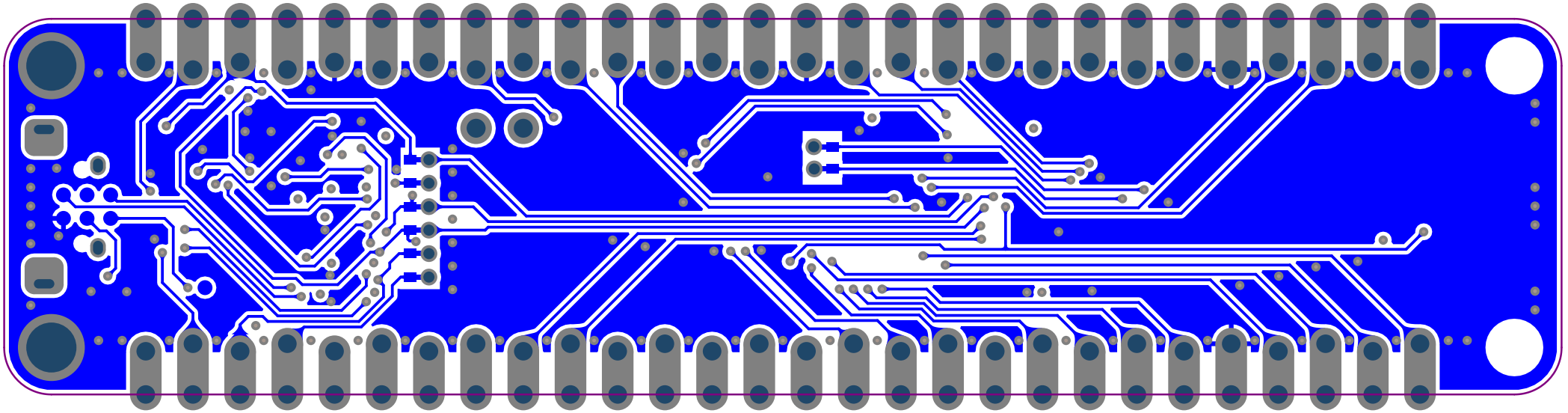

GND
DEBUGGER
PS
PIC18F57Q43
CURIOSITY NANO
RA7 RA6 RA5 RB3 RB0 RA2 RA1 RA0 GND RD7 RD6 RD5 RB5 RF7 RF6 RF5 RF4 GND RE1 RE0 RC1 RC0
POWER
32KHz
PIC® MCU
PIC18F57Q43
LED0
RF3
SW0
RB4
GND
RC2 RC3 RB2 RB1 RC4 RC5 RC6 RD4 GND RA3 RA4 RE2 RC7 RD0 RD1 RD2 RD3 GND RF0 RF1 RF2 RF3


RC0 RC1 RE0 RE1 GND RF4 RF5 RF6 RF7 RB5 RD5 RD6 RD7 GND RA0 RA1 RA2 RB0 RB3 RA5 RA6 RA7 VTG GND D0 D3 VOFF VBUS
GND
RC0
RC1
CONNECTIONS
RE3 RB4 RB6 RB7 RF0 RF1
D3 D2 D1 D0 RX TX
TARGET
DEBUGGER
CDC
A08-3021 Rev3
Microchip © 2019
GND
BOOT
CDC
RF3 RF2 RF1 RF0 GND RD3 RD2 RD1 RD0 RC7 RE2 RA4 RA3 GND RD4 RC6 RC5 RC4 RB1 RB2 RC3 RC2 D2 D1 TX RX ID NC
GND









Component list

Bill of Materials Fitted for Variant [Default Assembly] of Project [PIC18F57Q43_Curiosity_Nano.PrjPcb] (No PCB Document Selected)

Source Data From: PIC18F57Q43_Curiosity_Nano.PrjPcb
Project: PIC18F57Q43_Curiosity_Nano.PrjPcb
Variant: Default Assembly

Report Date: 26.10.2020 08:17
Print Date: 26.10.2020 08:17:07

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, C202	5	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	PIC18F57Q43 Curiosity Nano PCB documentation			PIC18F57Q43 Curiosity Nano PCB documentation
Fitted	PCBADOC1	1	A09-3290 PCBA files			PIC18F57Q43 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, R200, R204, R205	11	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	PIC18F57Q43 Curiosity Nano test			Fixture test for PIC18F57Q43 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, 1.6x1.6mm MLF
Fitted	U103, U104, U105, U106, U107	5	74LVC1T45FW4-7	Diodes Incorporated	74LVC1T45FW4-7	Single-Bit Dual-Supply Transceive, 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	PIC18F57Q43T-I/PT	Microchip	PIC18F57Q43T-I/PT	PIC18F57Q43 microcontroller, 48-pin TQFP 7mm x 7mm x 1.0mm
Not Fitted	C203, C204	0	8.2p	Yageo	CC0402CRNPO9BN8R2	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
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Approved

Notes