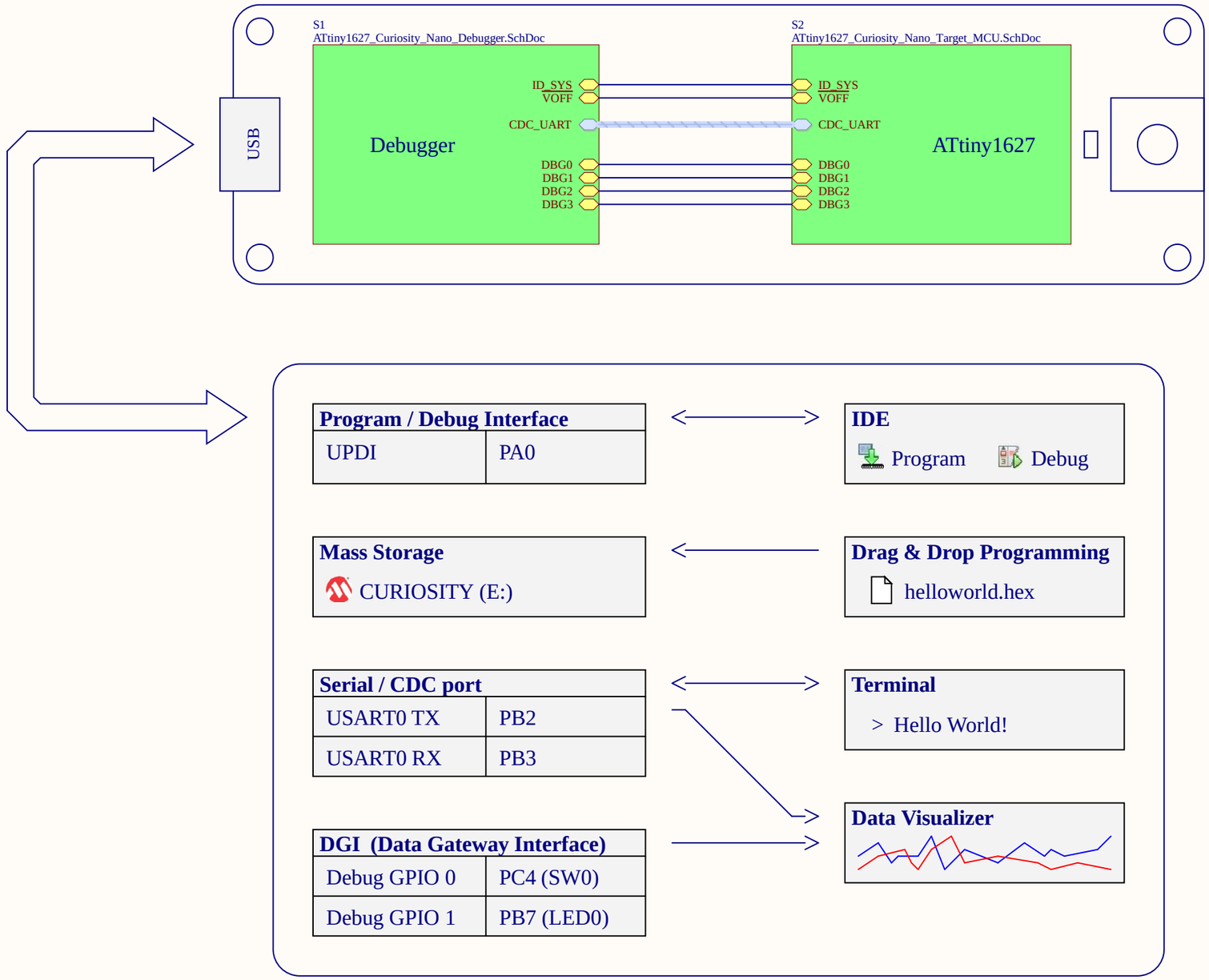
ATtiny1627 Curiosity Nano



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

TESTDOC1
A12-1314

TEST1
A11-0444

PCB1
A08-2986

FW1
A11-0406

PCBADOC1
A12-1382

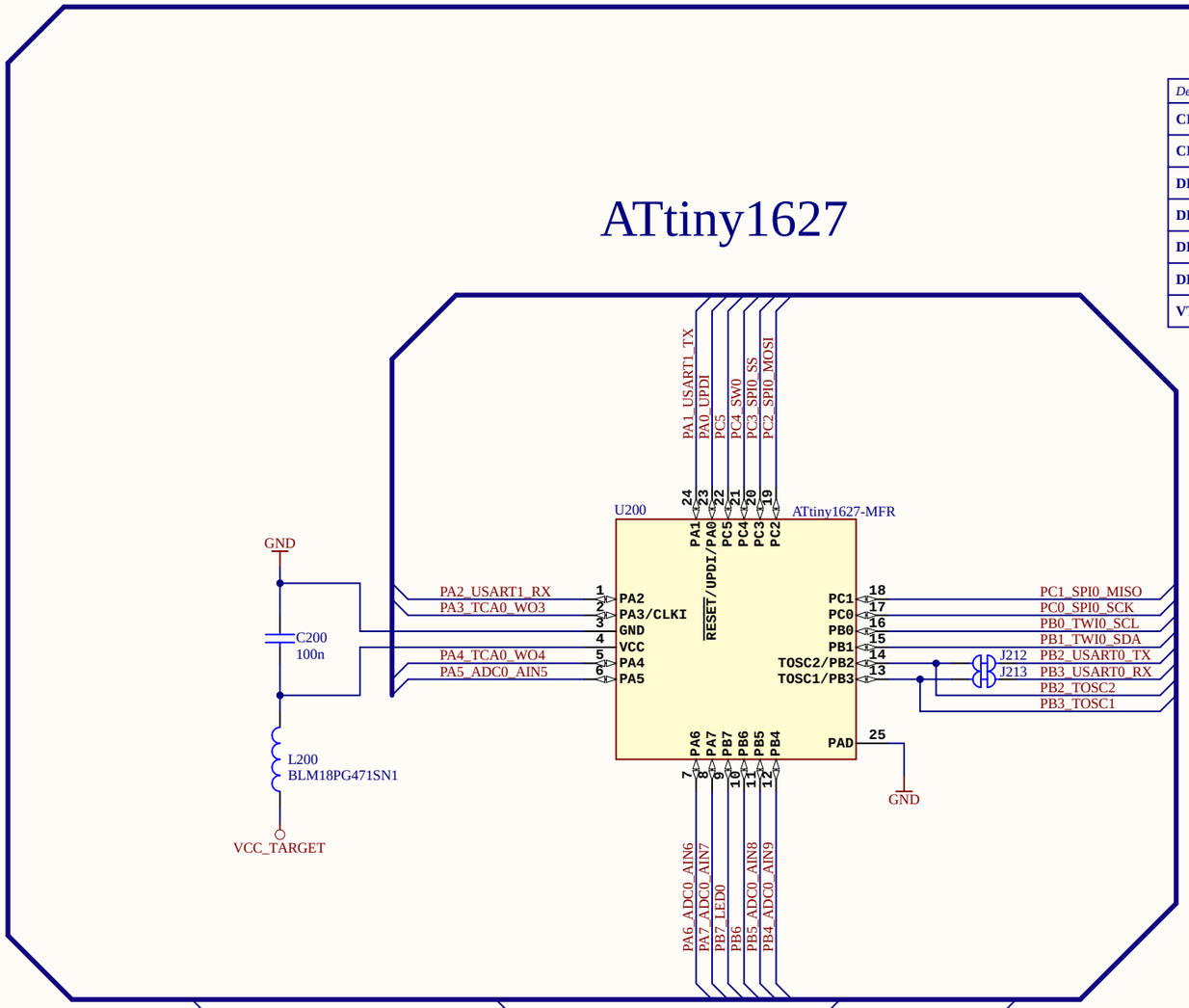
LABEL1
Product number/revision
Serial number
Label PCBA

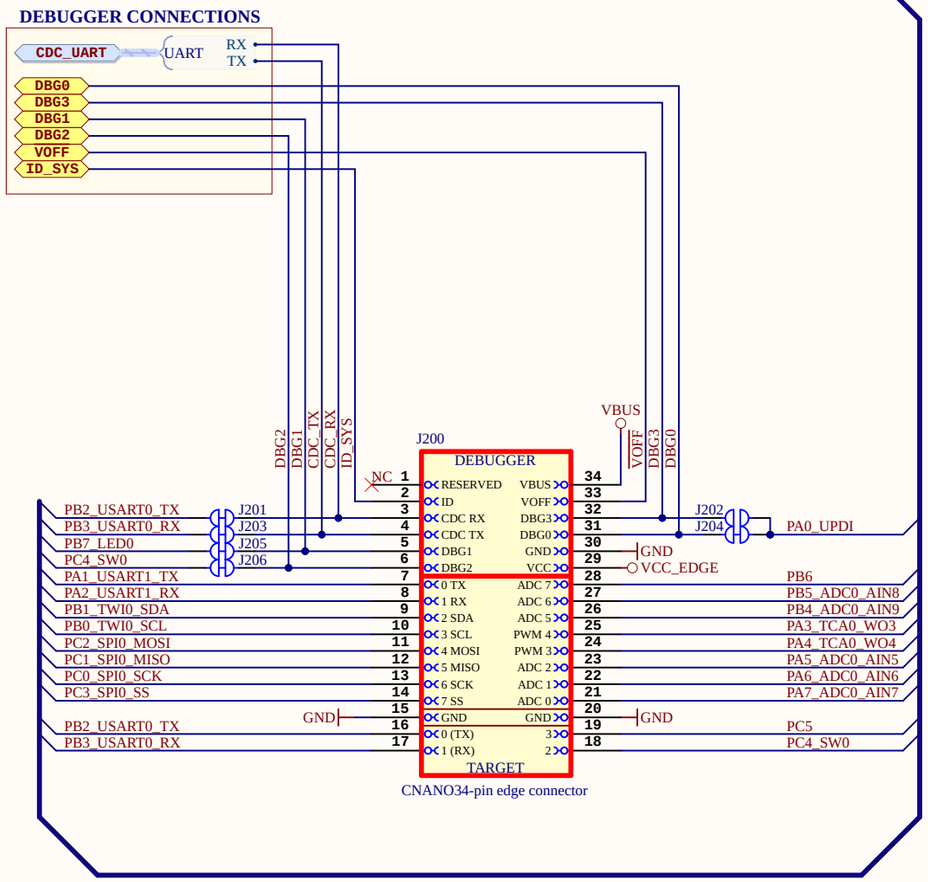
S3
ATtiny1627_Curiosity_Nano_Revision_History.SchDoc

Drawn By: Microchip Norway			
Engineer: ML, TF			
Project Title: *ATtiny1627 Curiosity Nano*			Designed with Altium — Altium.com
Sheet Title: Top Level			
Size A3	PCB Assembly Number: A09-3258	PCBA Revision: 2	Date: 11.12.2020
	PCB Number: A08-2986	PCB Revision: 2	Page: 1 of 4
File: ATtiny1627_Curiosity_Nano_TopLevel.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**	





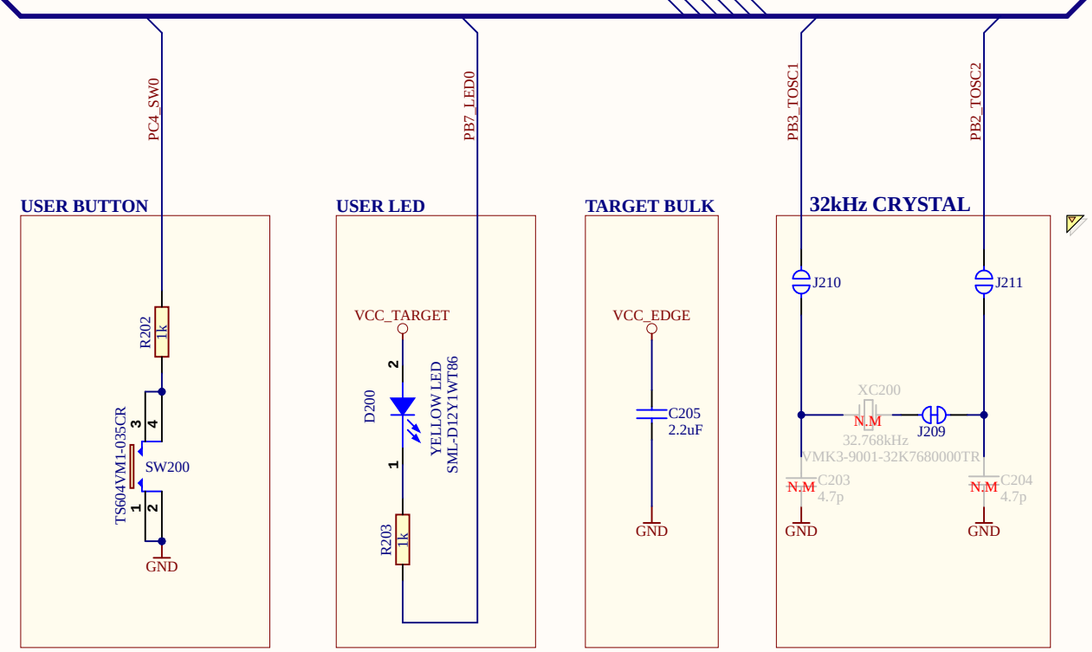
NOTE on UART/CDC:

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.

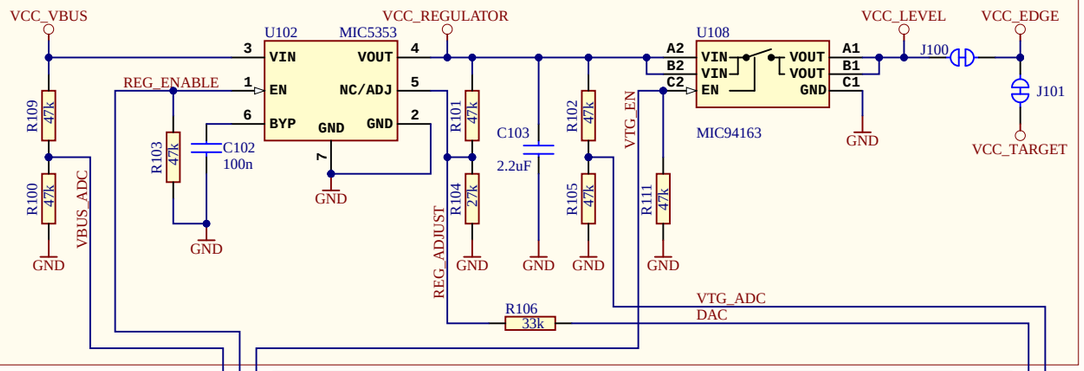
NOTE on I2C:

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



Drawn By: Microchip Norway			
Engineer: ML, TF			
Project Title: *ATtiny1627 Curiosity Nano*			Designed with Altium — Altium.com
Sheet Title: Target MCU			
Size A3	PCB Assembly Number: A09-3258	PCBA Revision: 2	Date: 11.12.2020
	PCB Number: A08-2986	PCB Revision: 2	Page: 2 of 4
File: ATtiny1627_Curiosity_Nano_Target_MCU.SchDoc			

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 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.

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

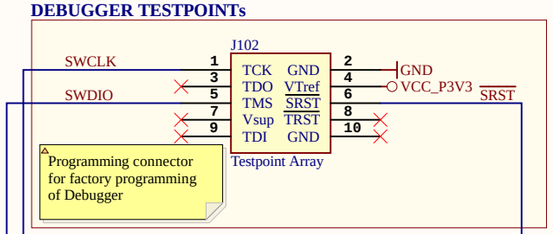
MIC5353:
Vin: 2.6V to 6V
Vout: 1.25V to 5.1V
Imax: 500mA
Dropout (typical): 50mV@150mA, 160mV @ 500mA
Accuracy: 2% initial
Thermal shutdown and current limit

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

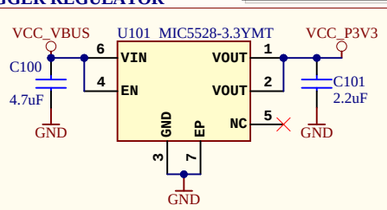
Interface / Signal	ICSP TARGET	UPDI TARGET	SWD TARGET
CDC TX	UART RX	UART RX	UART RX
CDC RX	UART TX	UART TX	UART TX
DBG0	DAT	UPDI	SWDAT
DBG1	CLK	GPIO	SWCLK
DBG2	GPIO	GPIO	SWO/GPIO
DBG3	MCLR	RESET	RESET
VCC	-	-	-

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

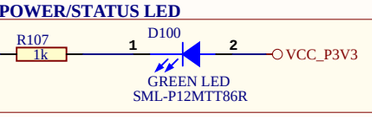
DEBUGGER TESTPOINTs



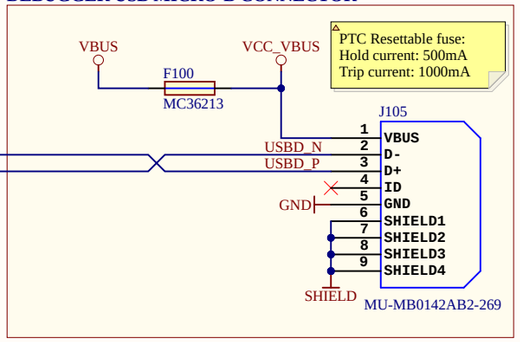
DEBUGGER REGULATOR



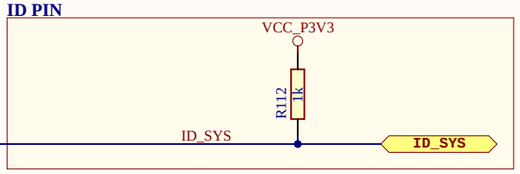
DEBUGGER POWER/STATUS LED

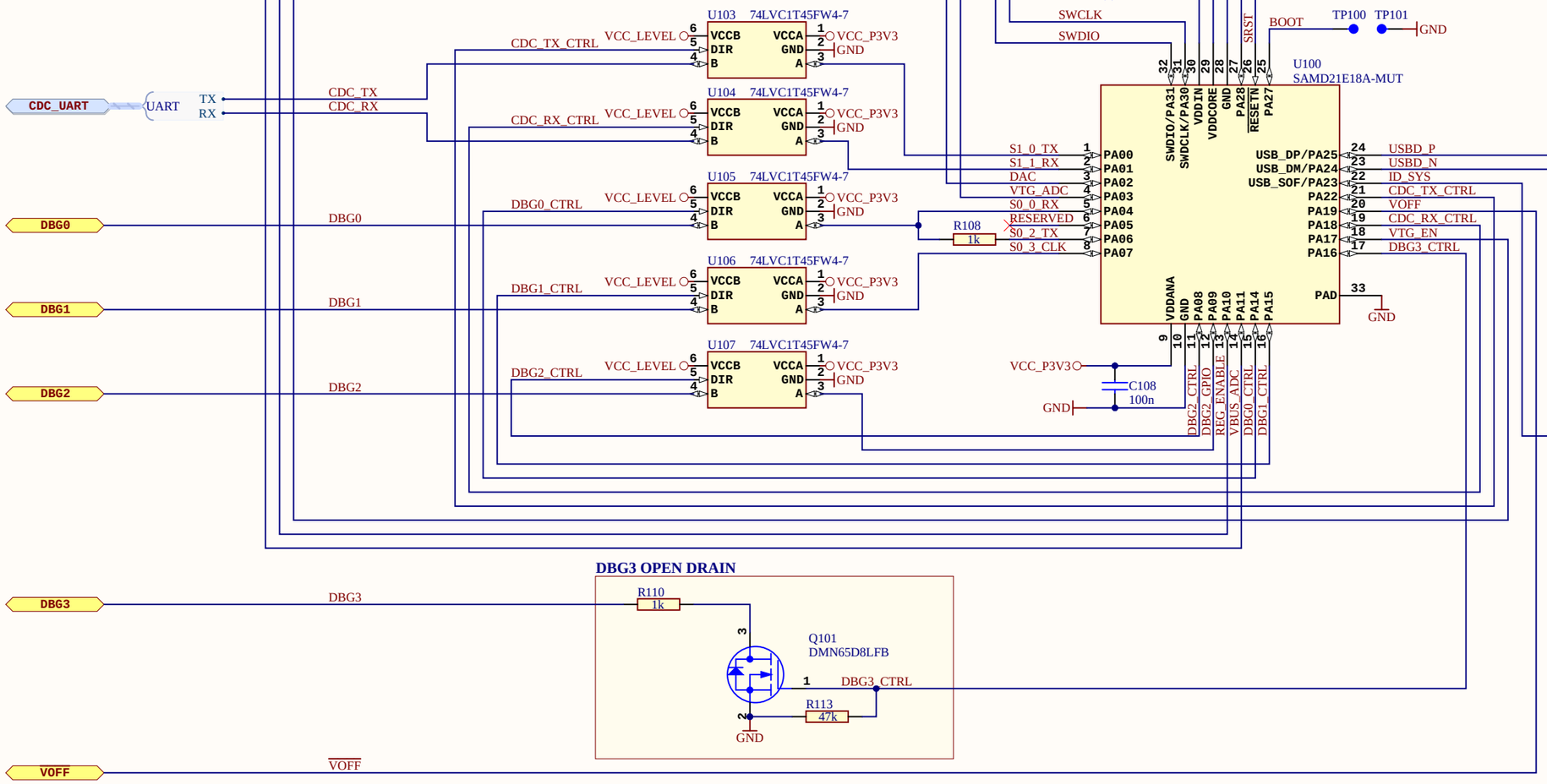


DEBUGGER USB MICRO-B CONNECTOR



ID PIN





DBG3 OPEN DRAIN

Drawn By: Microchip Norway			
Engineer: TF, HN			
Project Title: *ATtiny1627 Curiosity Nano*			Designed with Altium — Altium.com
Sheet Title: Debugger			
Size A3	PCB Assembly Number: A09-3258	PCBA Revision: 2	Date: 11.12.2020
	PCB Number: A08-2986	PCB Revision: 2	Page: 3 of 4
File: ATtiny1627_Curiosity_Nano_Debugger.SchDoc			

Revision History

PCB Assembly Rev 1:

Design Changes:

Initial Design

PCB:

PCB revision 1

PCB Assembly Rev 2:

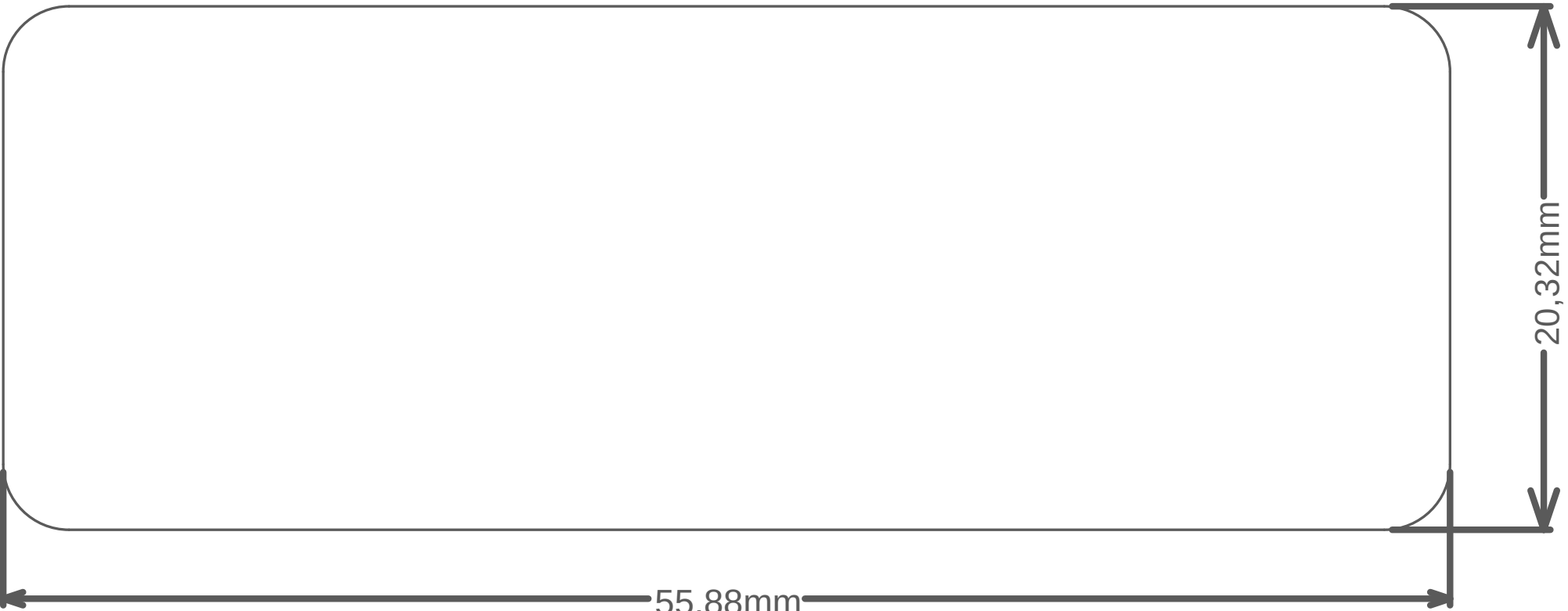
Design Changes:

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

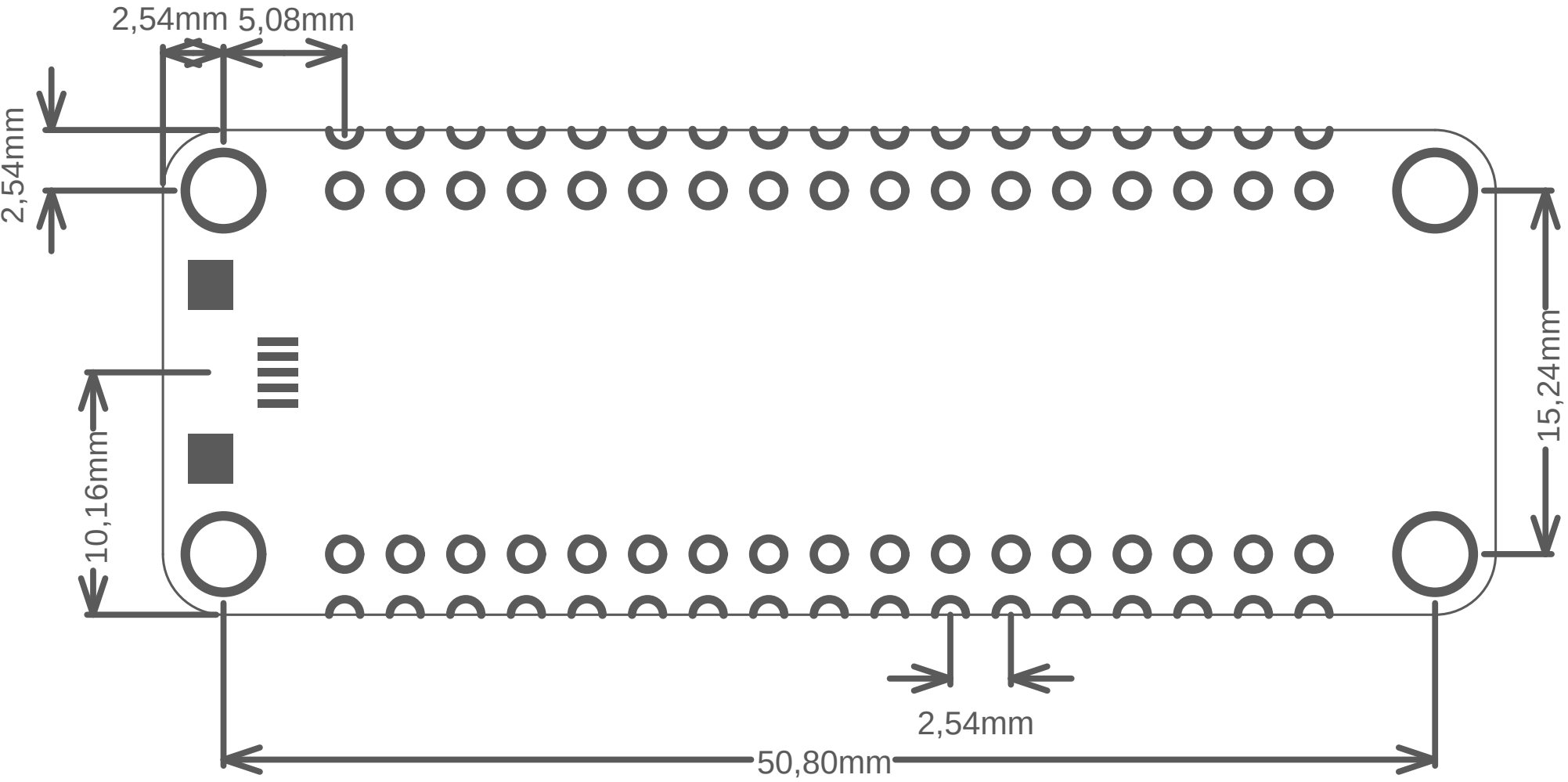
PCB:

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

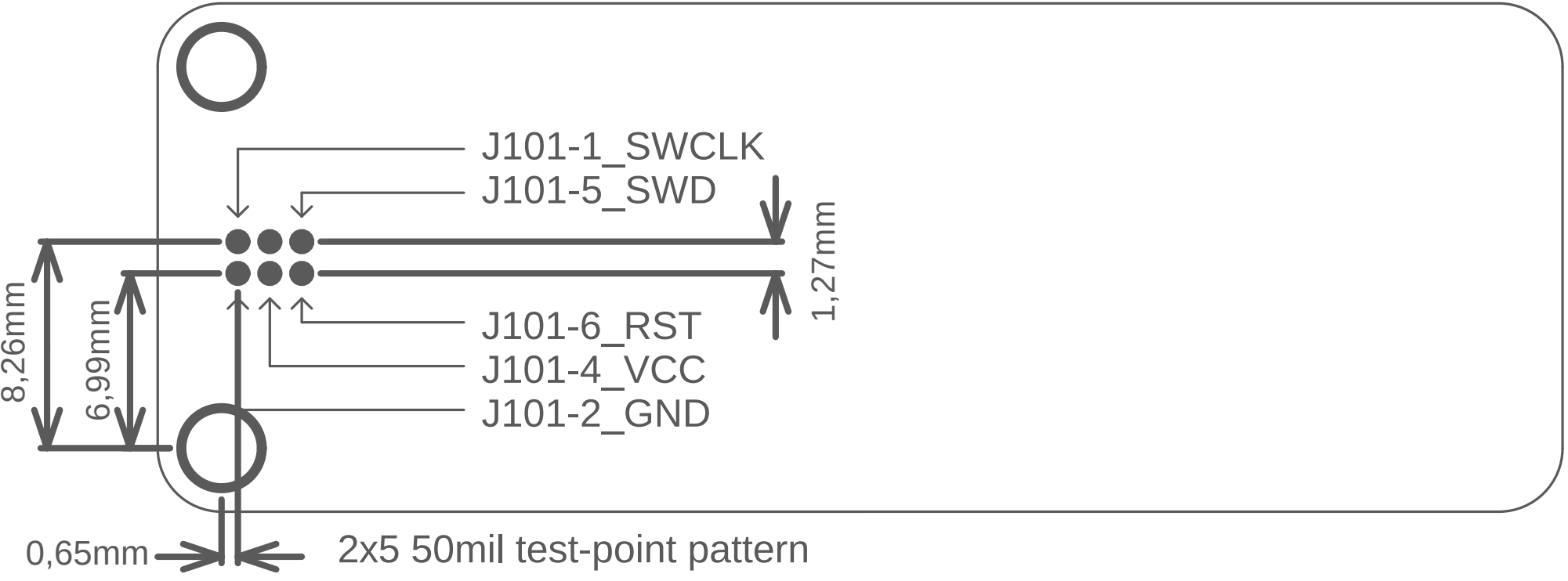
Drawn By: Microchip Norway		MICROCHIP	
Engineer: ML, TF			
Project Title: *ATtiny1627 Curiosity Nano*			Designed with Altium — Altium.com
Sheet Title: Revision History			
Size: A3	PCB Assembly Number: A09-3258	PCBA Revision: 2	Date: 11.12.2020
	PCB Number: A08-2986	PCB Revision: 2	Page: 4 of 4
File: ATtiny1627_Curiosity_Nano_Revision_History.SchDoc			

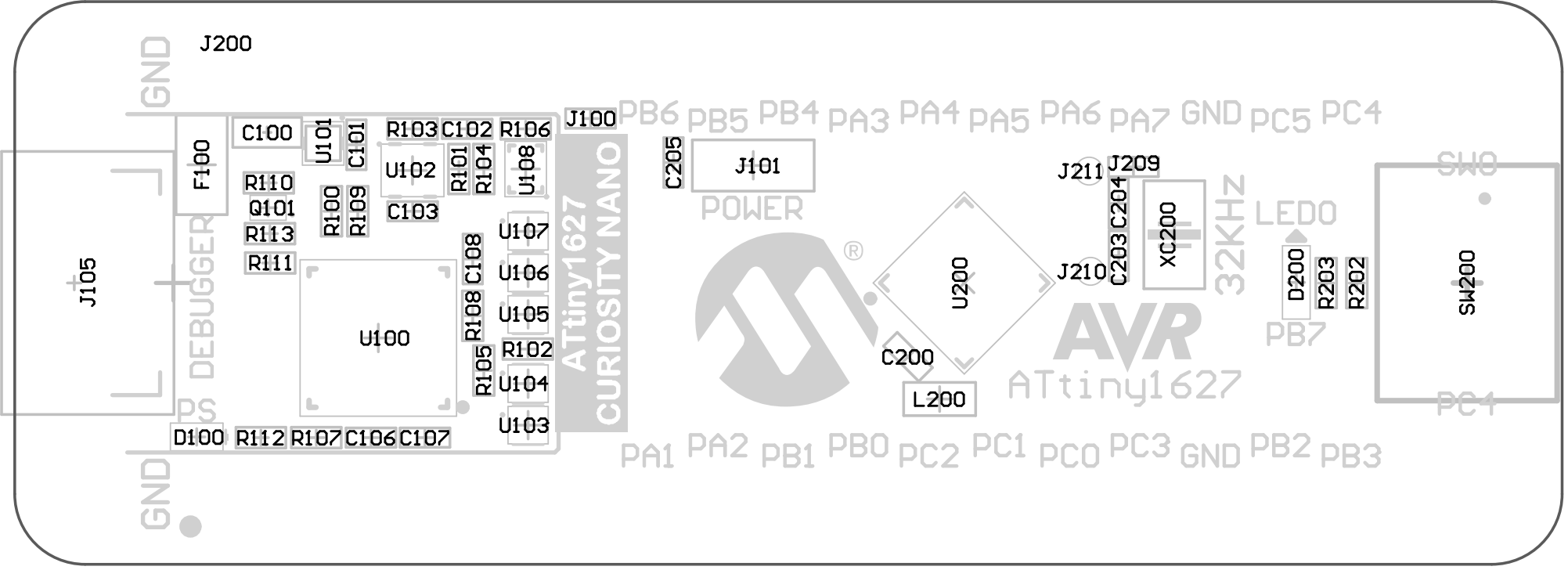

20,32mm
55,88mm

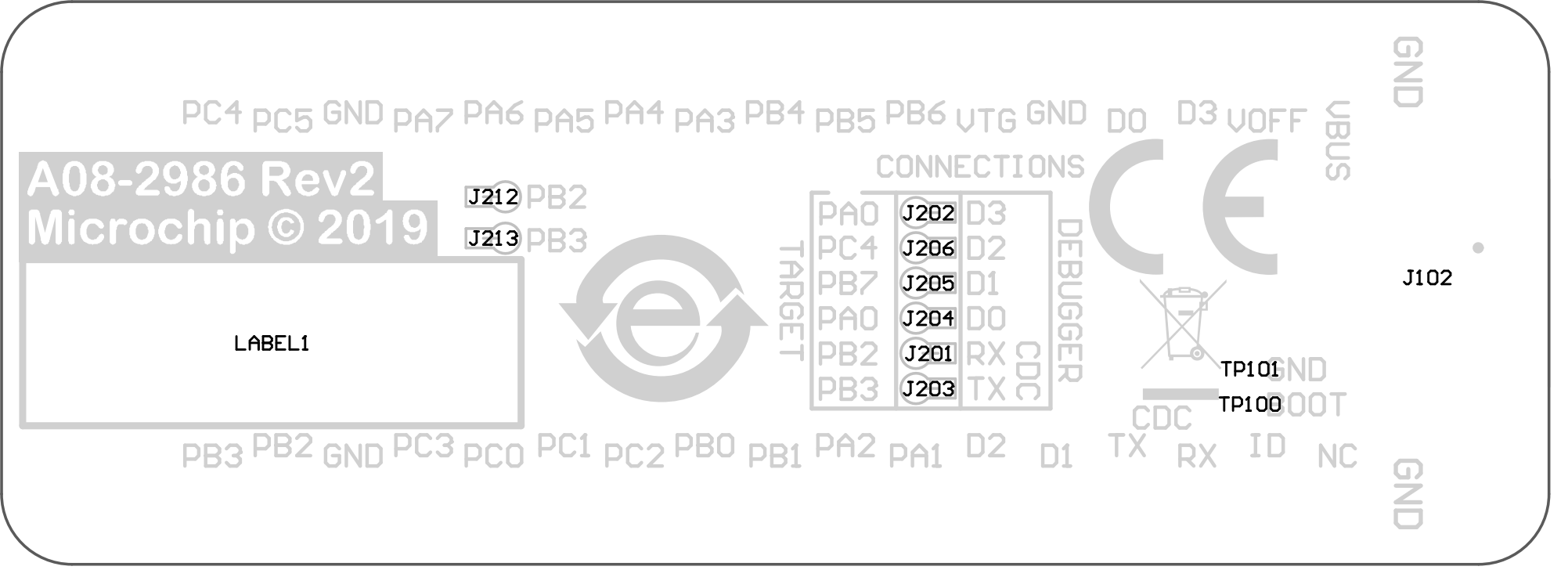
Connector Placement

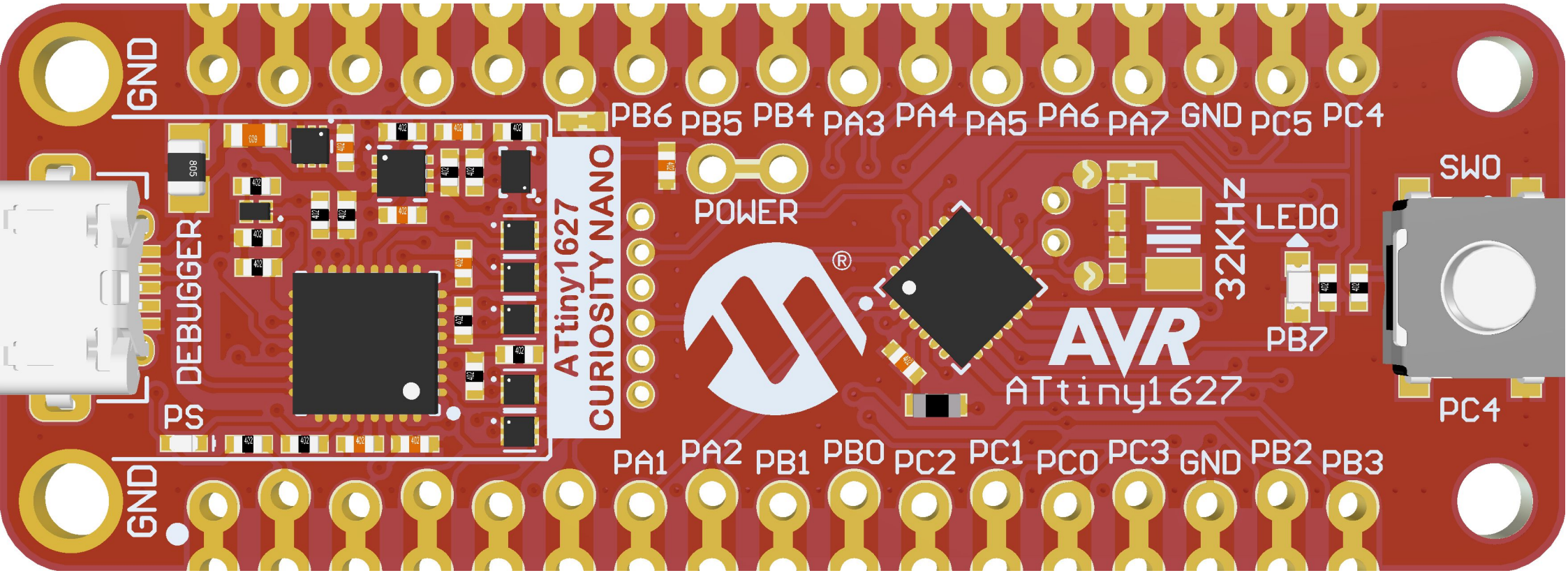


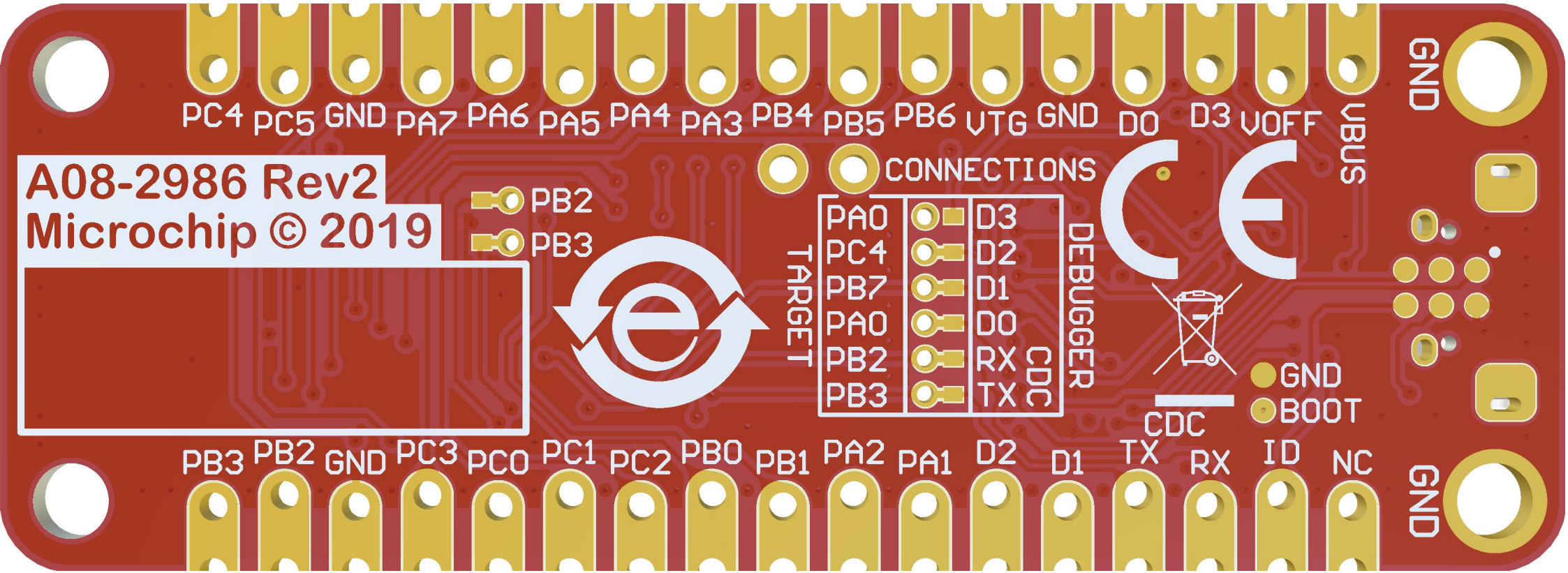
Test Point Placement

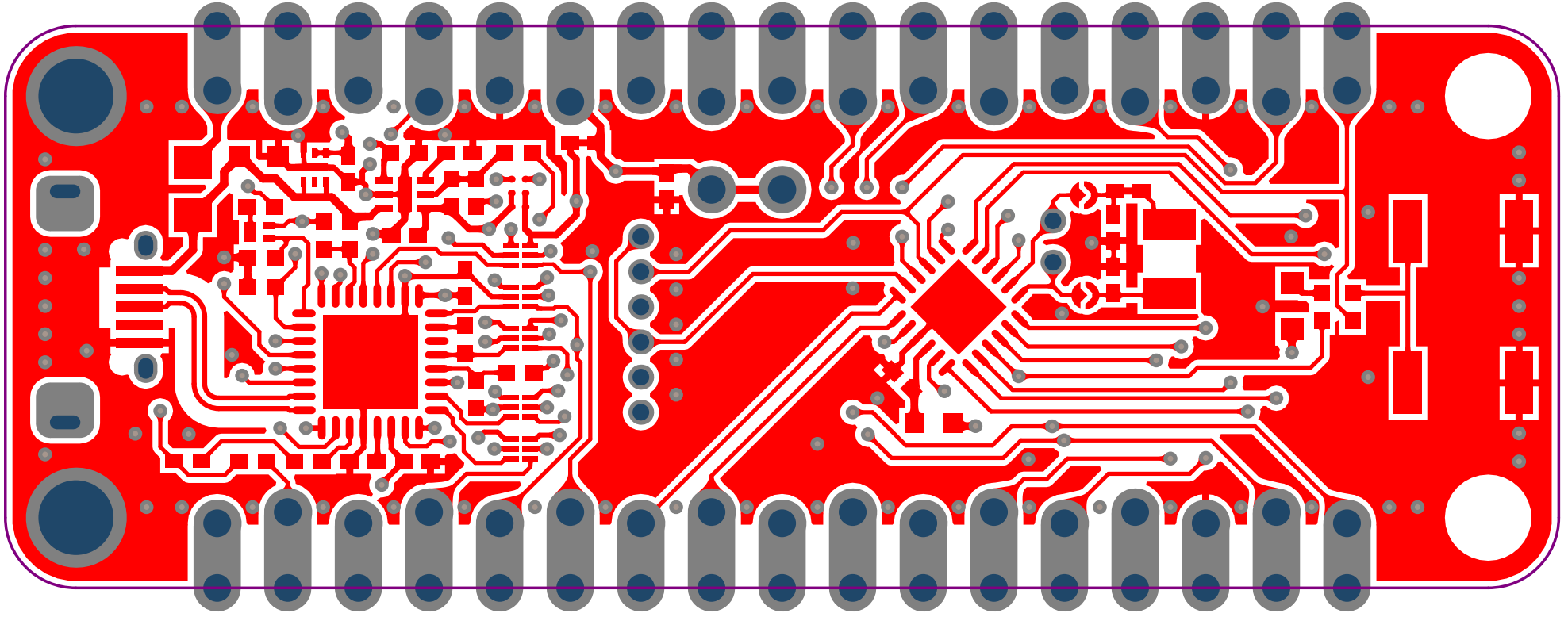


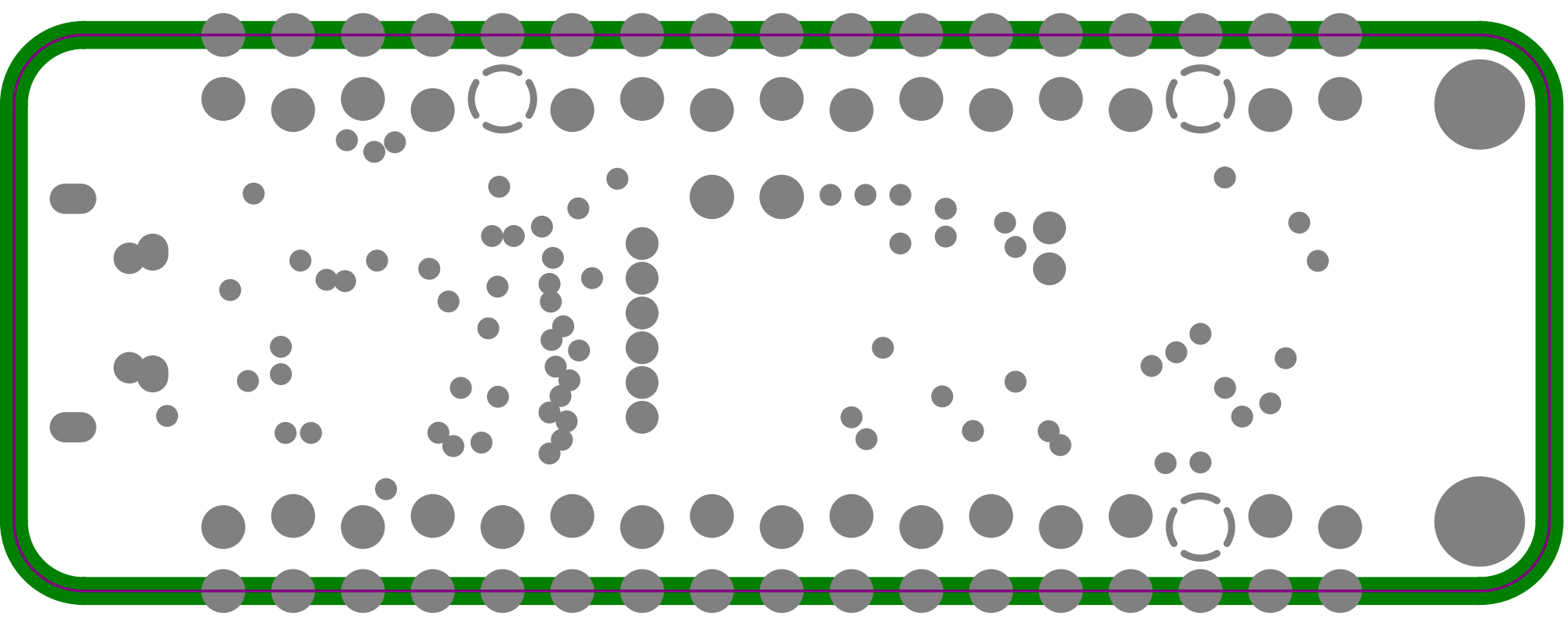

J200
GND
J100
PB6 PB5 PB4 PA3 PA4 PA5 PA6 PA7 GND PC5 PC4
C100
U101
C101
R103 C102 R106
U102
R101
R104
U108
F100
R110
Q101
R113
R111
R100
R109
C103
U107
U106
U105
U102
R102
U104
U103
C108
R108
R105
U100
ATtiny1627
CURIOSITY NANO
J105
DEBUGGER
PS
D100
R112
R107
C106
C107
GND
PA1 PA2 PB1 PB0 PC2 PC1 PC0 PC3 GND PB2 PB3
C205
J101
POWER
U200
C200
L200
J211
J209
J210
C203
C204
XC200
32KHz
LED0
PB7
D200
R203
R202
SW0
SW200
PC4
AVR
ATtiny1627

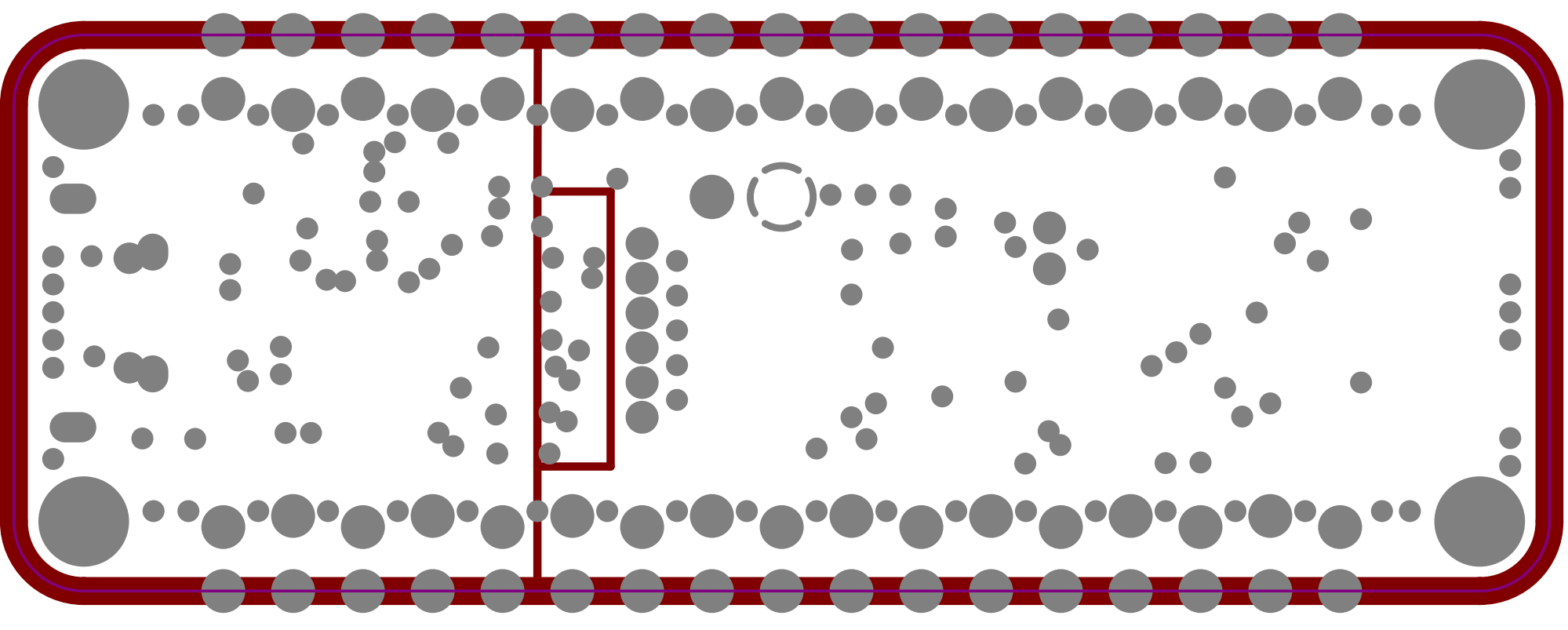

A08-2986 Rev2
Microchip © 2019
LABEL1
J212
J213
PB2
PB3
PC4 PC5 GND PA7 PA6 PA5 PA4 PA3 PB4 PB5 PB6 VTG GND D0 D3 VOFF VBUS
CONNECTIONS
TARGET
PA0 J202 D3
PC4 J206 D2
PB7 J205 D1
PA0 J204 D0
PB2 J201 RX
PB3 J203 TX
CDC
DEBUGGER
J102
TP101
TP100
GND
BOOT
CDC TX RX ID NC
PB3 PB2 GND PC3 PC0 PC1 PC2 PB0 PB1 PA2 PA1 D2 D1
GND

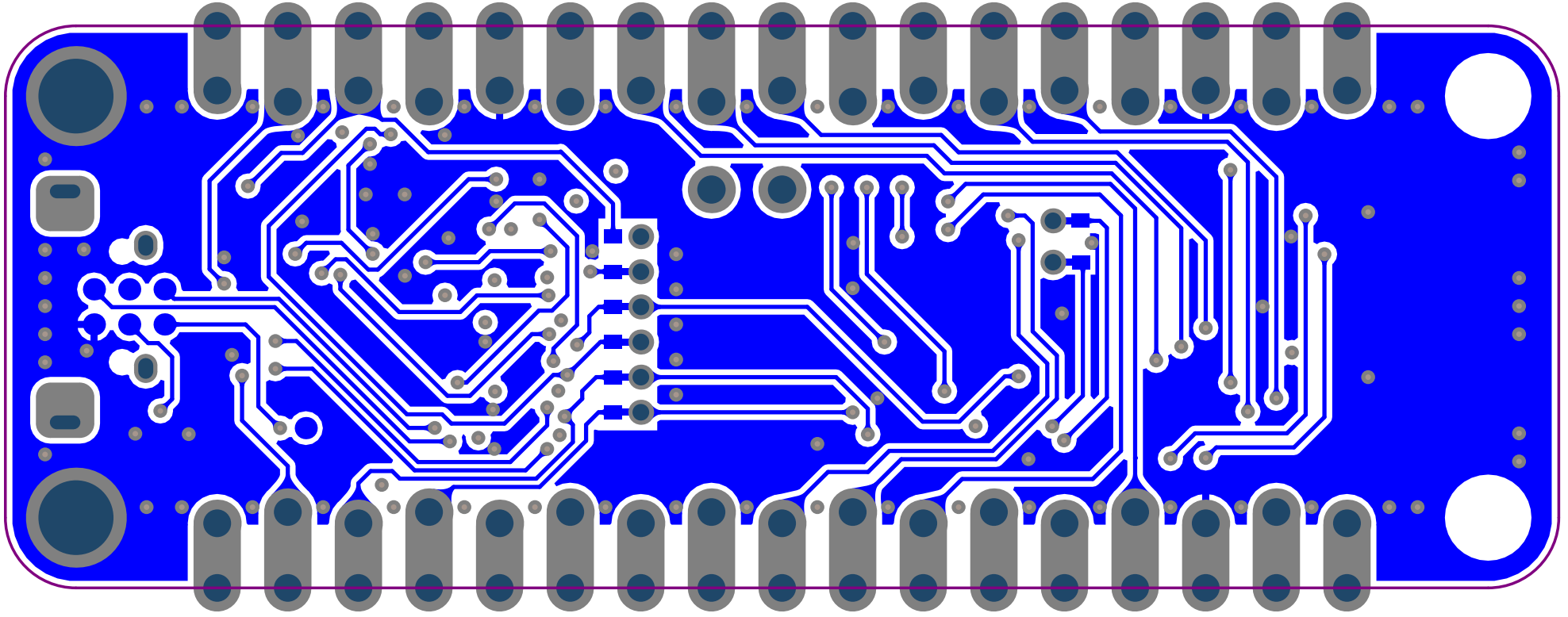

GND
PB6 PB5 PB4 PA3 PA4 PA5 PA6 PA7 GND PC5 PC4
SW0
POWER
DEBUGGER
PS
ATtiny1627
CURIOSITY NANO
32KHz
LED0
PB7
AVR
ATtiny1627
PC4
GND
PA1 PA2 PB1 PB0 PC2 PC1 PC0 PC3 GND PB2 PB3


PC4 PC5 GND PA7 PA6 PA5 PA4 PA3 PB4 PB5 PB6 VTG GND D0 D3 VOFF VBUS
GND
A08-2986 Rev2
Microchip © 2019
PB2
PB3
CONNECTIONS
PA0 D3
PC4 D2
PB7 D1
PA0 D0
PB2 RX
PB3 TX
TARGET
DEBUGGER
CDC
GND
BOOT
CDC
PB3 PB2 GND PC3 PC0 PC1 PC2 PB0 PB1 PA2 PA1 D2 D1 TX RX ID NC
GND









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 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	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	PCBADOC1	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	Dailyw ell 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 Transceive, 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	CC0402CRNPO9BN4R7	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