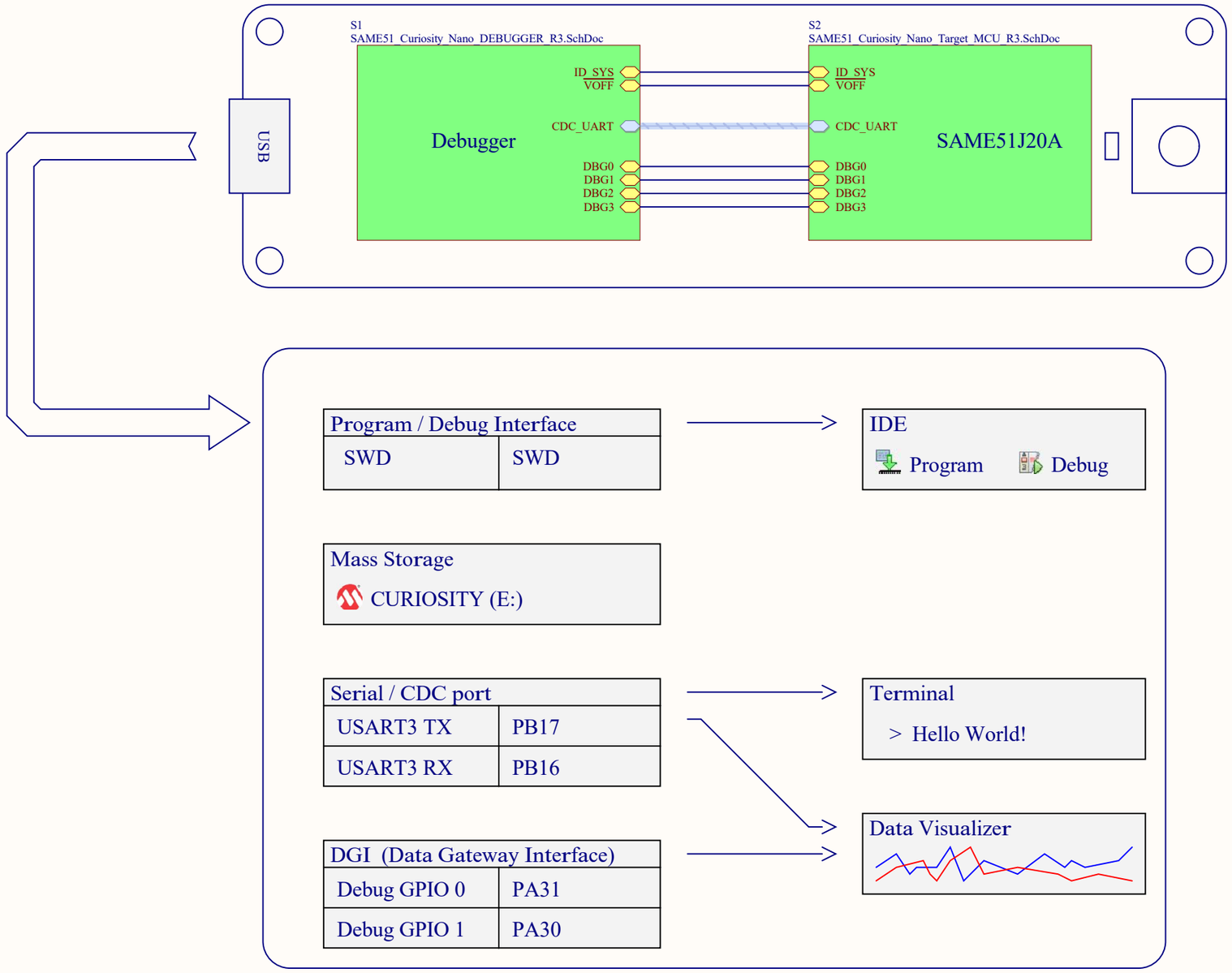
SAME51Curiosity Nano



*A09-3357: Product
A08-2804: Kit Box
A08-2996: Outer Label
*A09-3306: ESD Bag w/Hdrs
A08-1664: ESD Bag
A08-2988: (2) 1x28pin M 2.54 Hdrs
A09-0614: Inner Assembly Label
*A09-3358: ESD Bag w/Pop Board and label
A09-0608: ESD bag
A09-0614: Inner Assembly Label
*PCBA: A09-3360(Populated PCB w/label)
A08-3073: bare PCB
Axx-xxxx: all electronic components
A09-0611: Label PCBA
A11-0406: nEDBG firmware
A11-0483: SAME51 CNANO Test
A12-1314: CNANO Test Instructions
A12-1442: PCBA docs

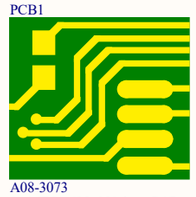
TESTDOC1
A12-1314

TEST1
A11-0483

FW1
A11-0406

PCBADOC1
A12-1442

PCB1



A08-3073
SAME51-CNANO bare PCB

LABEL1: A09-0611

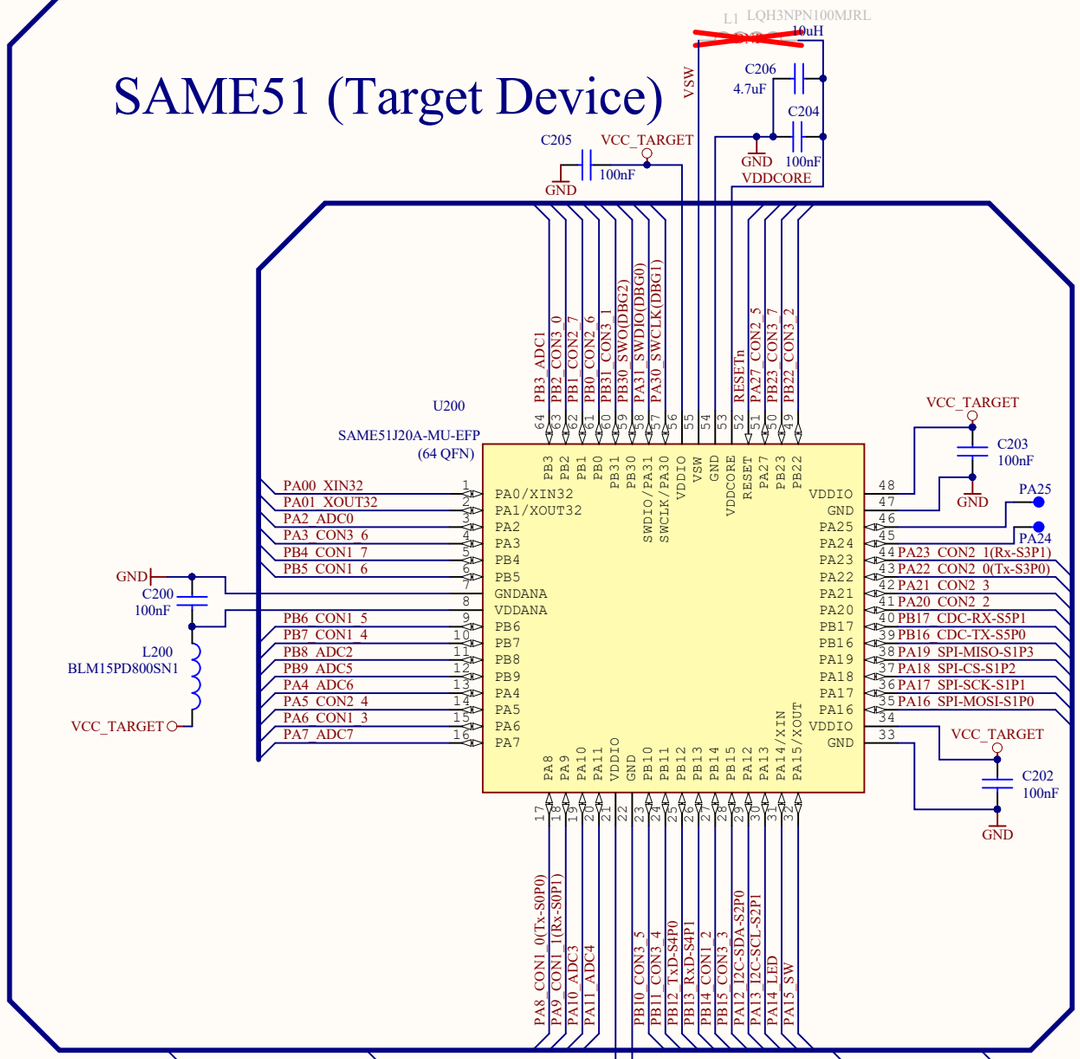
Product number/revision
Serial number

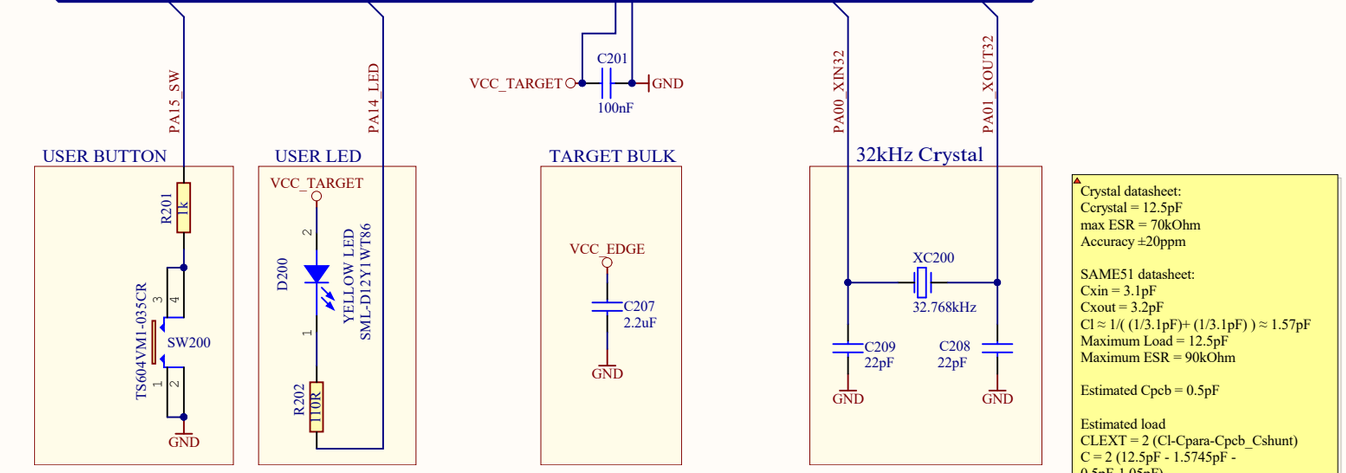
Label PCBA

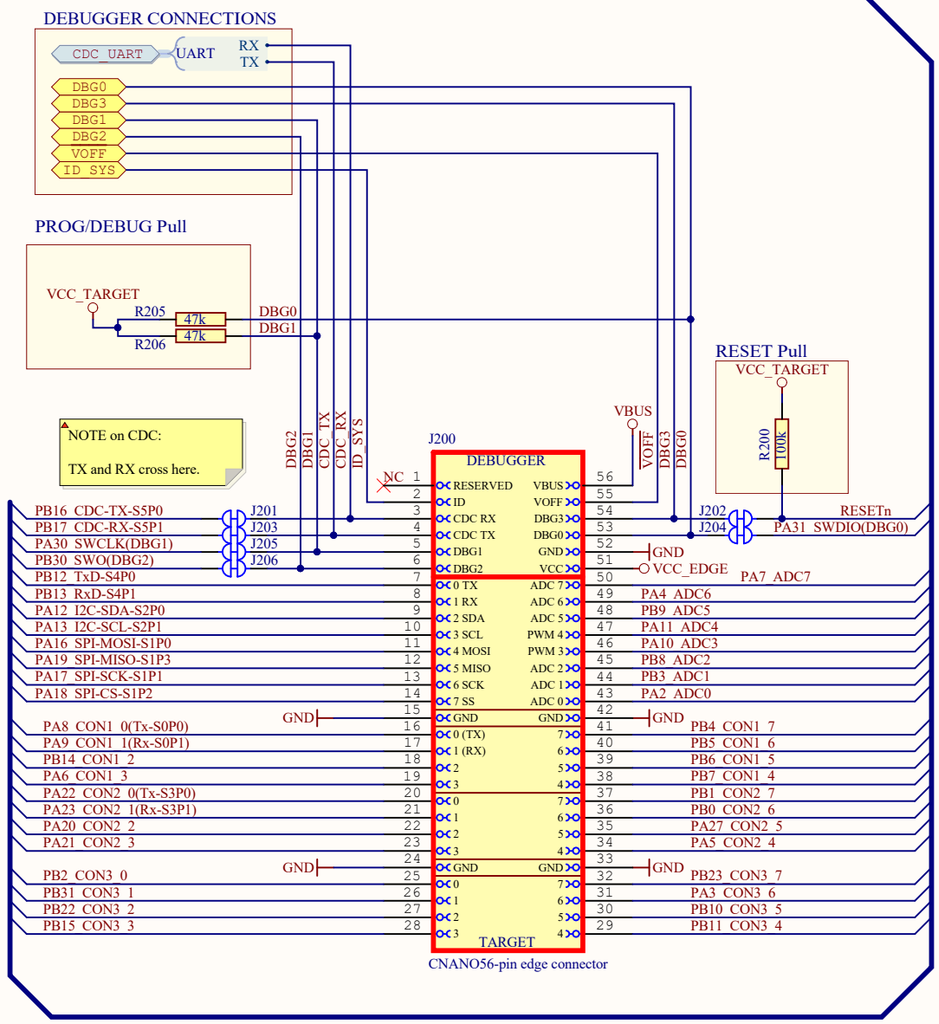
S3
SAME51_Curiosity_Nano_Rev_History_R3.SchDoc

Drawn By: Jesus Aviles		MICROCHIP	
Engineer: Keaton Stanley			
Project Title: SAME51 Curiosity Nano			Designed with Altium — Altium.com
Sheet Title: Top Level			
Size: A3	PCB Assembly Number: A09-3360	PCBA Revision: 3	Date: 6/3/2020
	PCB Number: A09-3073	PCB Revision: 3	Page: 1 of 4
File: SAME51_Curiosity_Nano_TopLevel_R3.SchDoc			

SAME51 (Target Device)



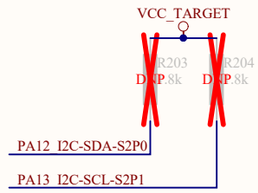




NOTE on UART/CDC:

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.



Crystal datasheet:
Ccrystal = 12.5pF
max ESR = 70kOhm
Accuracy ±20ppm

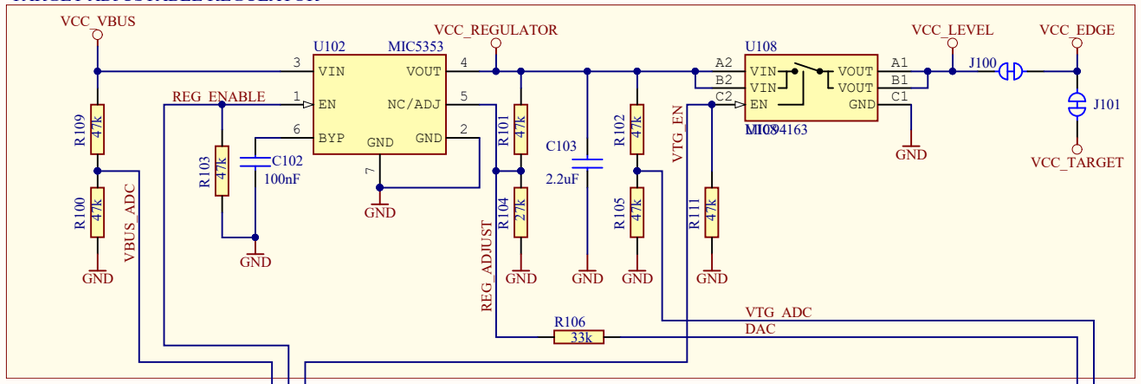
SAME51 datasheet:
Cxin = 3.1pF
Cxout = 3.2pF
Cl ≈ 1/((1/3.1pF)+ (1/3.1pF)) ≈ 1.57pF
Maximum Load = 12.5pF
Maximum ESR = 90kOhm

Estimated Cpcb = 0.5pF

Estimated load
CLEXT = 2 (Cl-Cpara-Cpcb_Cshunt)
C = 2 (12.5pF - 1.5745pF - 0.5pF-1.05pF)
C = 18.75pF

Drawn By: Jesus Aviles			
Engineer: Keaton Stanley			
Project Title: SAME51 Curiosity Nano			Designed with Altium — Altium.com
Sheet Title: Target MCU			
Size: A3	PCB Assembly Number: A09-3360	PCBA Revision: 3	Date: 6/3/2020
	PCB Number: A09-3073	PCB Revision: 3	Page: 2 of 4
File: SAME51_Curiosity_Nano_Target_MCU_R3.SchDoc			

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 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

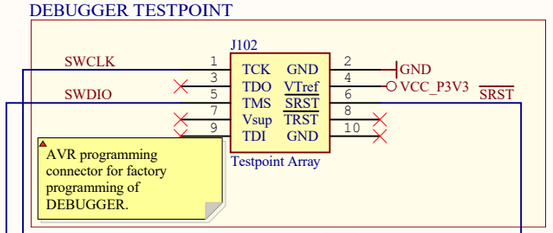
MIC5353:
Vin: 2.6V to 6V
Vout: 1.25V to 5.1V
Imax: 500mA
Dropout (typical): 50mV@150mA, 160mV @ 500mA
Accuracy: 2% initial
Thermal shutdown and current limit

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

Adjustable output and limitations:
- The DEBUGGER can adjust the output voltage of the regulator between 1.25V and 5.1V to the target.
- 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 output switch 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.
- Firmware feedback loop will adjust the output voltage accuracy to within 0.5%.

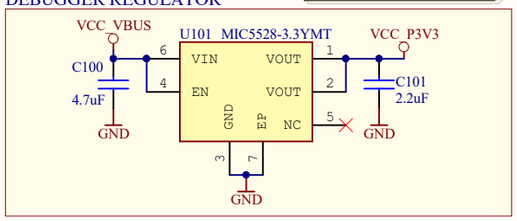
Signal \ Interface	SWD TARGET
CDC TX	UART RX
CDC RX	UART TX
DBG0	SWDAT
DBG1	SWCLK
DBG2	GPIO
DBG3	nRESET
VCC	3.3V

DEBUGGER TESTPOINT

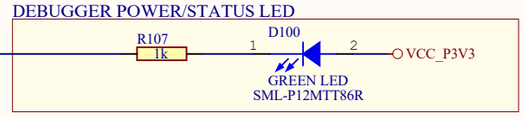


DEBUGGER REGULATOR

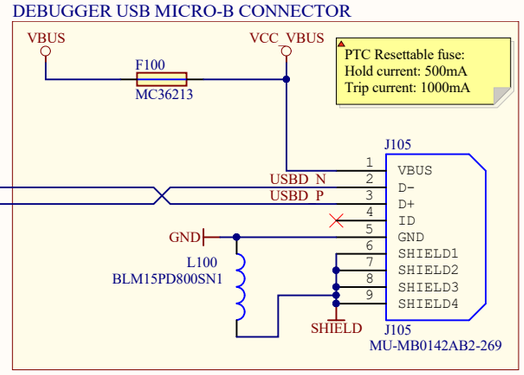
MIC5528:
Vin: 2.5V to 5.5V
Vout: Fixed 3.3V
Imax: 500mA
Dropout: 260mV @ 500mA



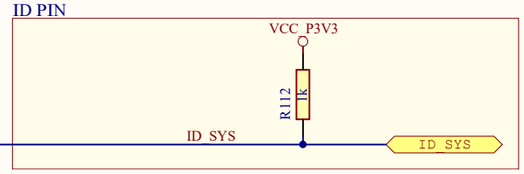
DEBUGGER POWER/STATUS LED

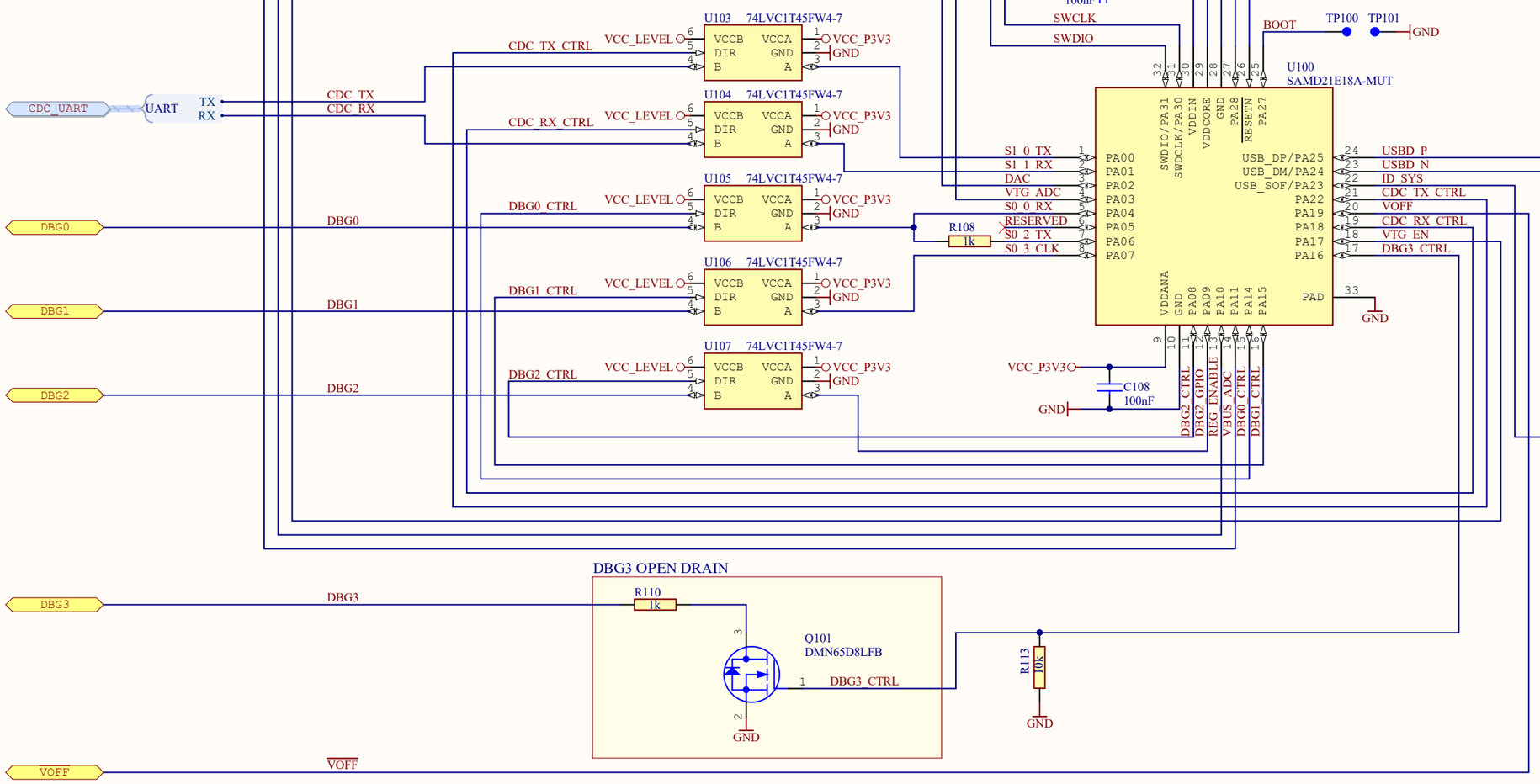


DEBUGGER USB MICRO-B CONNECTOR



ID PIN





DBG3 OPEN DRAIN

Drawn By: Jesus Aviles			
Engineer: Keaton Stanley			
Project Title: SAME51 Curiosity Nano			Designed with Altium — Altium.com
Sheet Title: Debugger			
Size: A3	PCB Assembly Number: A09-3360	PCBA Revision: 3	Date: 6/3/2020
	PCB Number: A09-3073	PCB Revision: 3	Page: 3 of 4
File: SAME51_Curiosity_Nano_DEBUGGER_R3.SchDoc			

Revision History

PCB Assembly Rev 1:

Design Changes:

Initial Design

PCB:

PCB revision 1

PCB Assembly Rev 2:

Design Changes:

Changed design to SAME51 64-pin TQFP

PCB:

PCB Assembly Rev 3:

Design Changes:

PCB:

U200 Had soldermask above heastsink, Silk and paste layer fixed in footprint.
Some silk corrected for port names.

Drawn By: Jesus Aviles		MICROCHIP	
Engineer: Keaton Stanley			
Project Title: SAME51 Curiosity Nano			Designed with Altium Altium.com
Sheet Title: Revision History			
Size A3	PCB Assembly Number: A09-3360	PCBA Revision: 3	
	PCB Number: A09-3073	PCB Revision: 3	Date: 6/3/2020
File: SAME51_Curiosity_Nano_Rev_History_R3.SchDoc			Page: 4 of 4