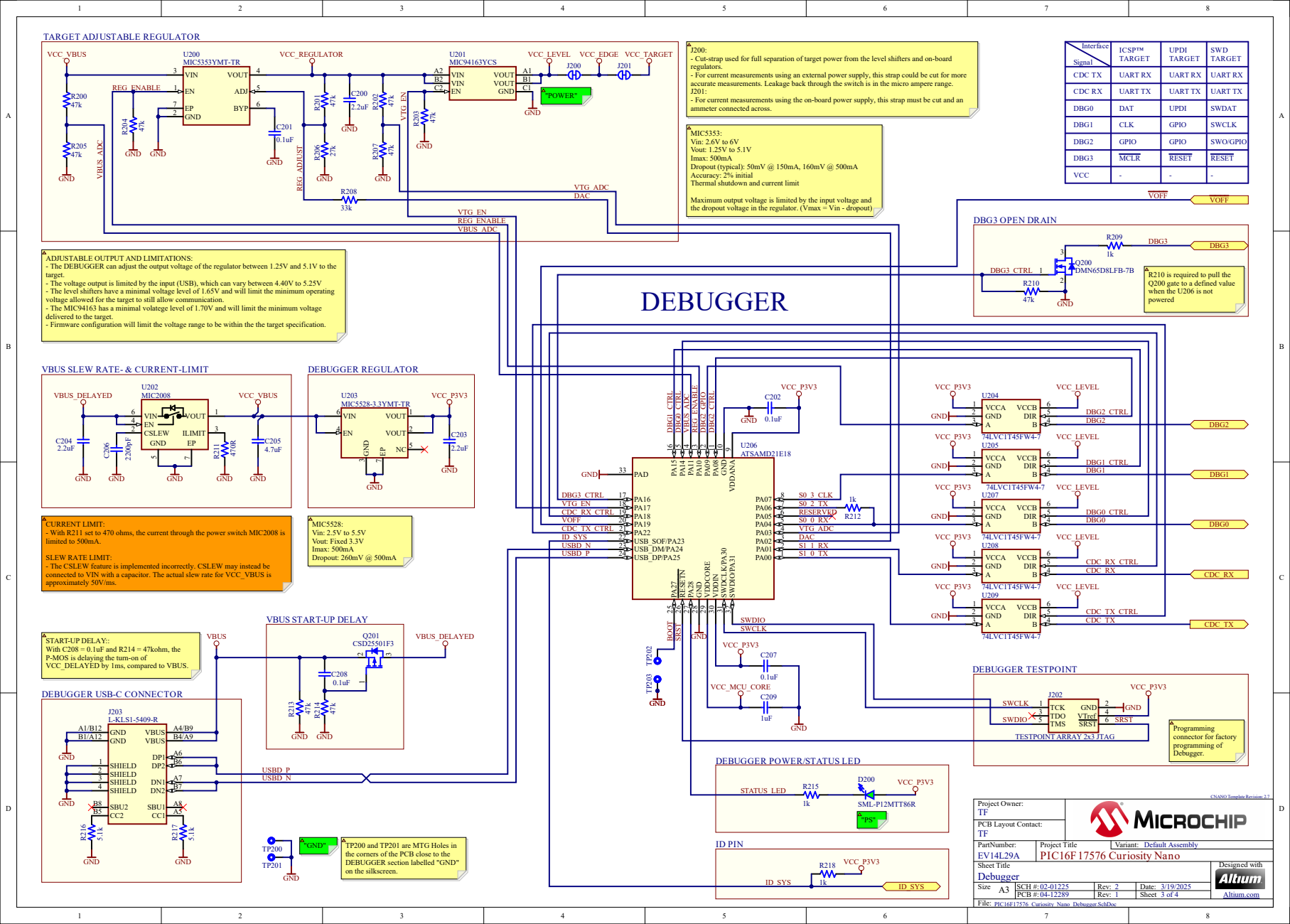
TARGET ADJUSTABLE REGULATOR
U200
MIC5353YMT-TR
U201
MIC94163YCS
VCC_VBUS
VCC_REGULATOR
VCC_LEVEL
VCC_EDGE
VCC_TARGET
REG_ENABLE
VBUS_ADC
REG_ADJUST
VTG_EN
VTG_ADC
DAC
VTG_EN
REG_ENABLE
VBUS_ADC
"POWER"
J200:
- Cut-strap used for full separation of target power from the level shifters and on-board regulators.
- 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.
J201:
- For current measurements using the on-board power supply, this strap must be cut and an ammeter connected across.
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
-
-
-
VOFF
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
DBG3 OPEN DRAIN
Q200
DMN65D8LFB-7B
R209
1k
R210
47k
DBG3_CTRL
R210 is required to pull the Q200 gate to a defined value when the U206 is not powered
VBUS SLEW RATE- & CURRENT-LIMIT
U202
MIC2008
VBUS_DELAYED
VCC_VBUS
CURRENT LIMIT:
- With R211 set to 470 ohms, the current through the power switch MIC2008 is limited to 500mA.
SLEW RATE LIMIT:
- The CSLEW feature is implemented incorrectly. CSLEW may instead be connected to VIN with a capacitor. The actual slew rate for VCC_VBUS is approximately 50V/ms.
DEBUGGER REGULATOR
U203
MIC5528-3.3YMT-TR
VCC_P3V3
MIC5528:
Vin: 2.5V to 5.5V
Vout: Fixed 3.3V
Imax: 500mA
Dropout: 260mV @ 500mA
U206
ATSAMD21E18
VCC_P3V3
DBG3_CTRL
VTG_EN
CDC_RX_CTRL
VOFF
CDC_TX_CTRL
ID_SYS
USBD_N
USBD_P
S0_3_CLK
S0_2_TX
RESERVED
S0_0_RX
VTG_ADC
DAC
S1_1_RX
S1_0_TX
SWDIO
SWCLK
BOOT
SRST
U204
U205
U207
U208
U209
74LVC1T45FW4-7
VCC_LEVEL
DBG2_CTRL
DBG1_CTRL
DBG0_CTRL
CDC_RX_CTRL
CDC_TX_CTRL
DBG2
DBG1
DBG0
CDC_RX
CDC_TX
VBUS START-UP DELAY
Q201
CSD25501F3
START-UP DELAY::
With C208 = 0.1uF and R214 = 47kohm, the P-MOS is delaying the turn-on of VCC_DELAYED by 1ms, compared to VBUS.
DEBUGGER USB-C CONNECTOR
J203
L-KLS1-5409-R
USBD_P
USBD_N
DEBUGGER TESTPOINT
J202
TESTPOINT ARRAY 2x3 JTAG
Programming connector for factory programming of Debugger.
DEBUGGER POWER/STATUS LED
D200
SML-P12MTT86R
STATUS_LED
"PS"
ID PIN
TP200 and TP201 are MTG Holes in the corners of the PCB close to the DEBUGGER section labelled "GND" on the silkscreen.
"GND"
Project Owner: TF
PCB Layout Contact: TF
PartNumber: EV14L29A
Project Title: PIC16F17576 Curiosity Nano
Variant: Default Assembly
Sheet Title: Debugger
Size: A3
SCH #:02-01225
PCB #:04-12289
Rev: 2
Rev: 1
Date: 3/19/2025
Sheet 3 of 4
File: PIC16F17576_Curiosity_Nano_Debugger.SchDoc
Designed with Altium
Altium.com