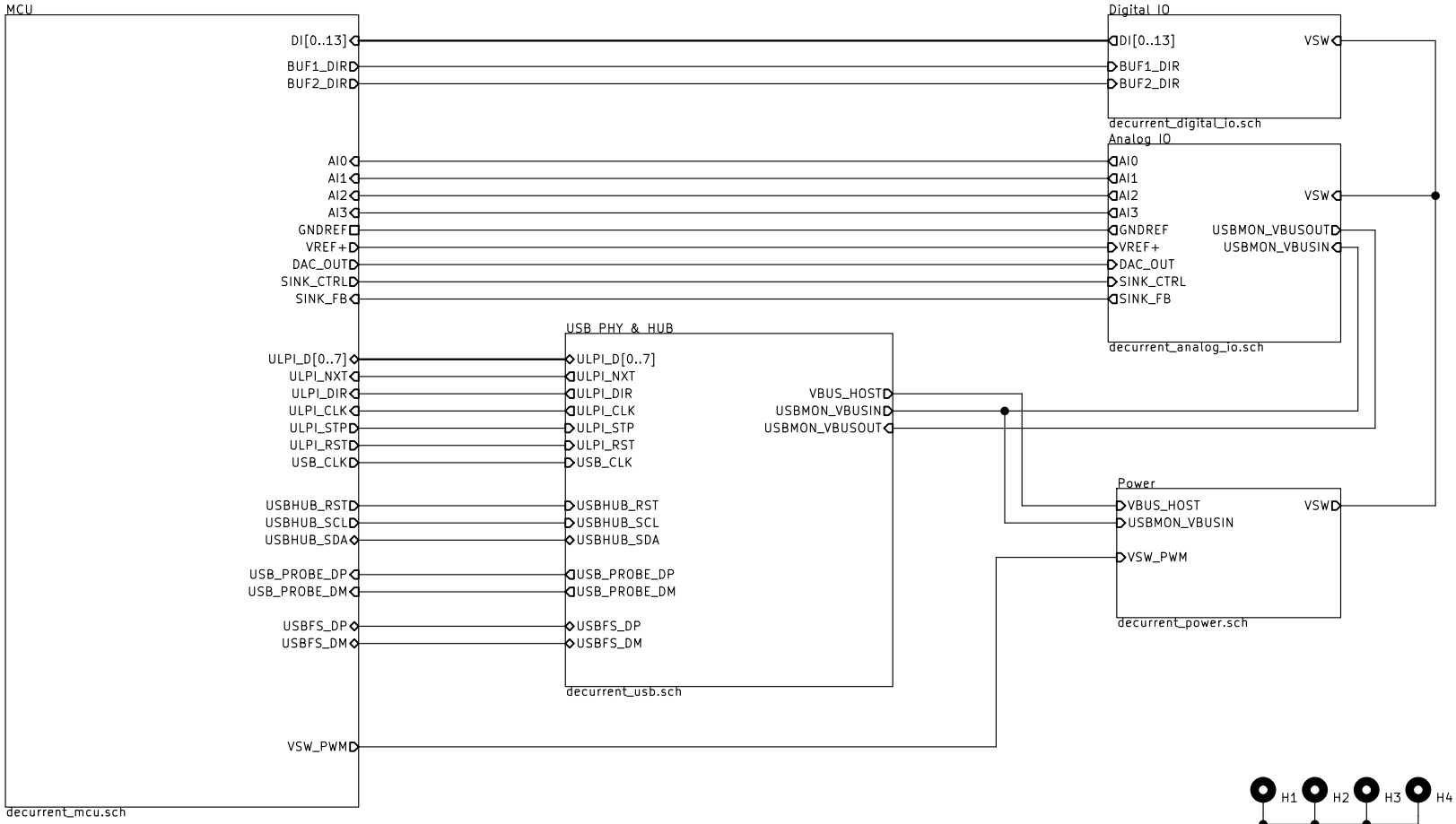
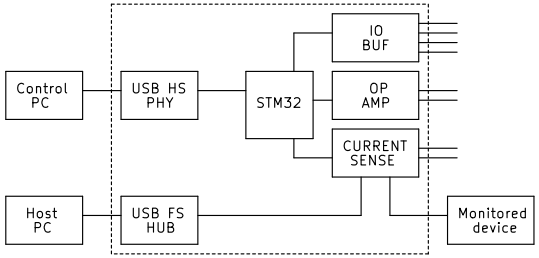


DECurrent

Mixed signal logic analyzer, current monitor and USB protocol analyzer.

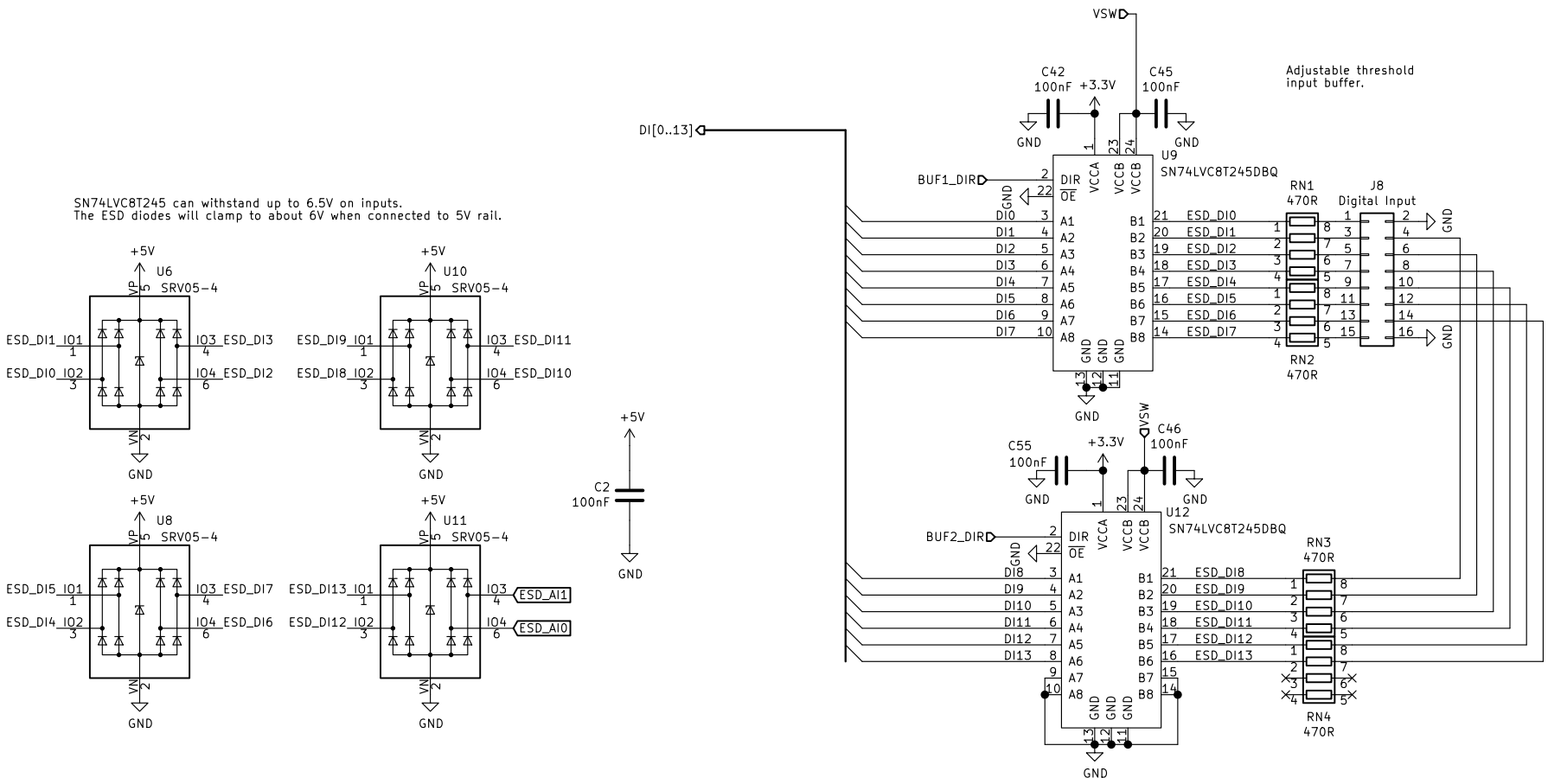


devEmbedded

Sheet: /
File: decurrent.sch

Title: DECurrent – mixed signal logic analyzer

Size: A4	Date: 2020-02-08	**Rev: 1**
KiCad E.D.A. kicad 5.0.2-bee76a070ubuntu18.04.1		Id: 1/6



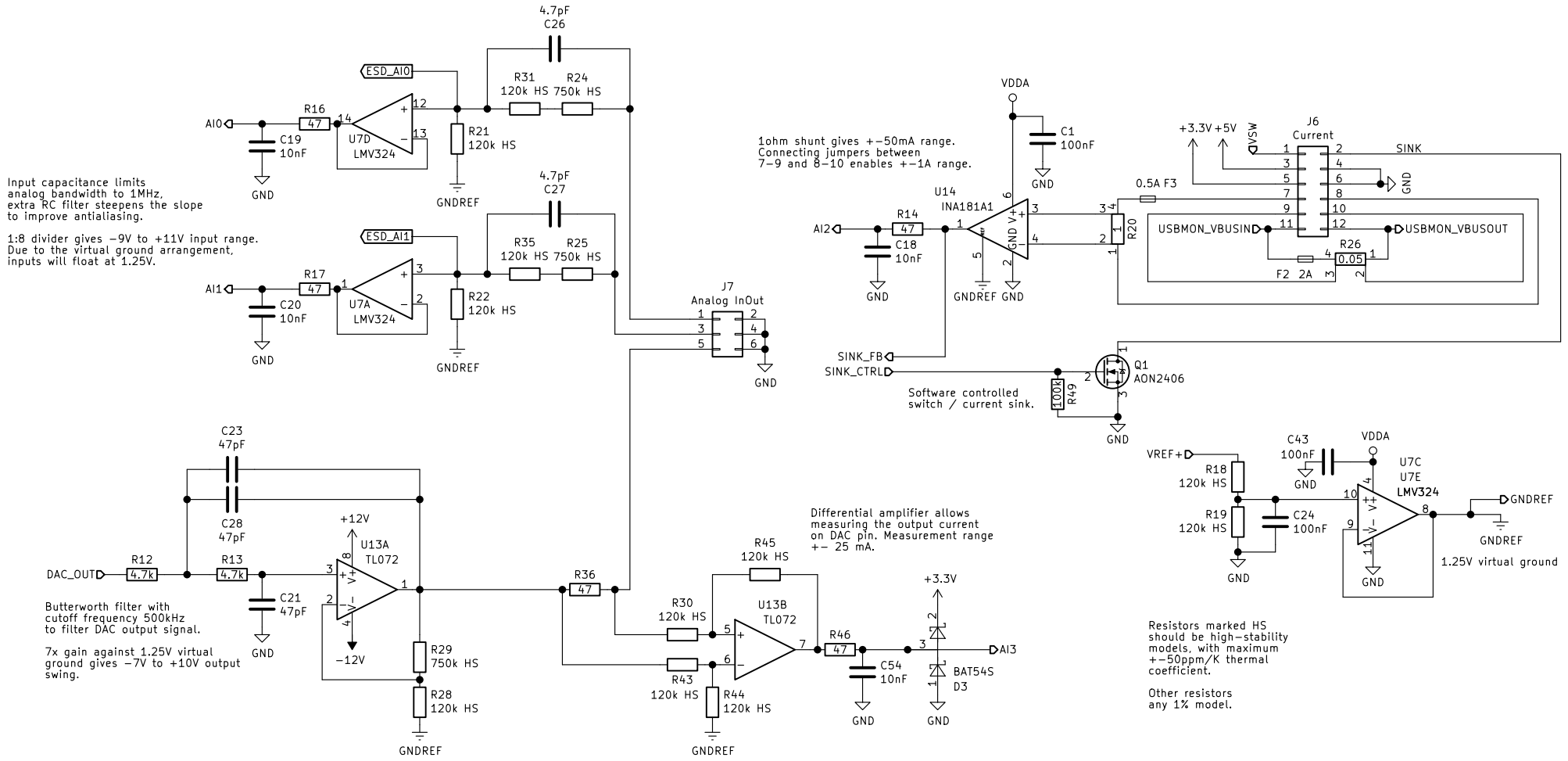
devEmbedded

Sheet: /Digital IO/

File: decurrent_digital_io.sch

Title: DECurrent – mixed signal logic analyzer

Size: A4	Date: 2020-02-08	**Rev: 1**
KiCad E.D.A. kicad 5.0.2-bee76a070ubuntu18.04.1		Id: 2/6



Internal calibration process:

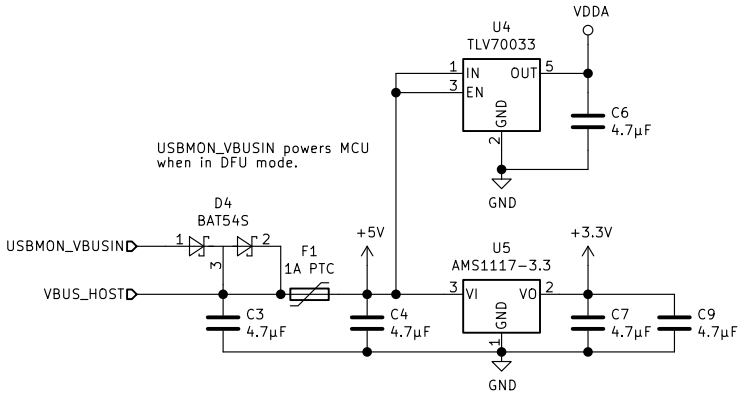
1. Measure GNDREF level against VREF+.
   Compensates for U7B input offset and R18/R19 tolerance.
2. Measure values on AI0, AI1 and AI2 when inputs disconnected.
   Compensates for opamp input offsets.
3. Measure values on AI0 and AI1 when inputs shorted to GND.
   Compensates for resistor divider tolerance.
4. Connect DAC output to AI0 and measure value at several points.
   Compensates for gain & offset in DAC output amp.
   Compensates for offset in DAC feedback amp.
5. Optionally, measure external reference voltage to
   compensate for VREF+ inaccuracies.
6. Optionally, calibrate shunt resistors using
   external current source.

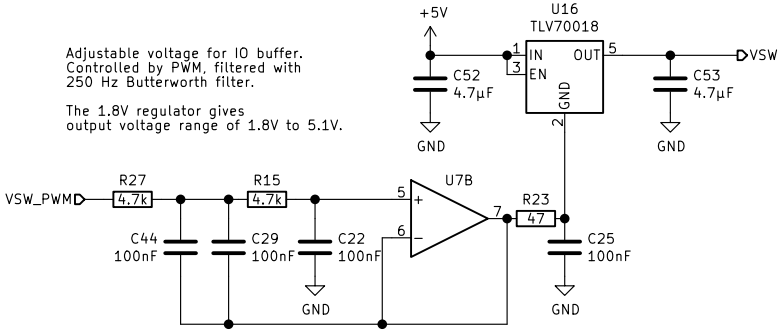
devEmbedded

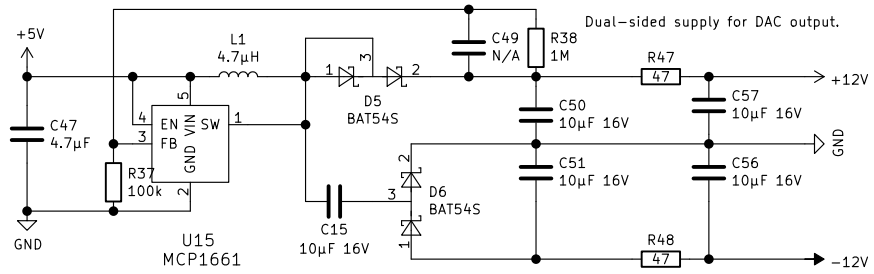
Sheet: /Analog IO/
File: decurrent_analog_io.sch

Title: DECurrent − mixed signal logic analyzer

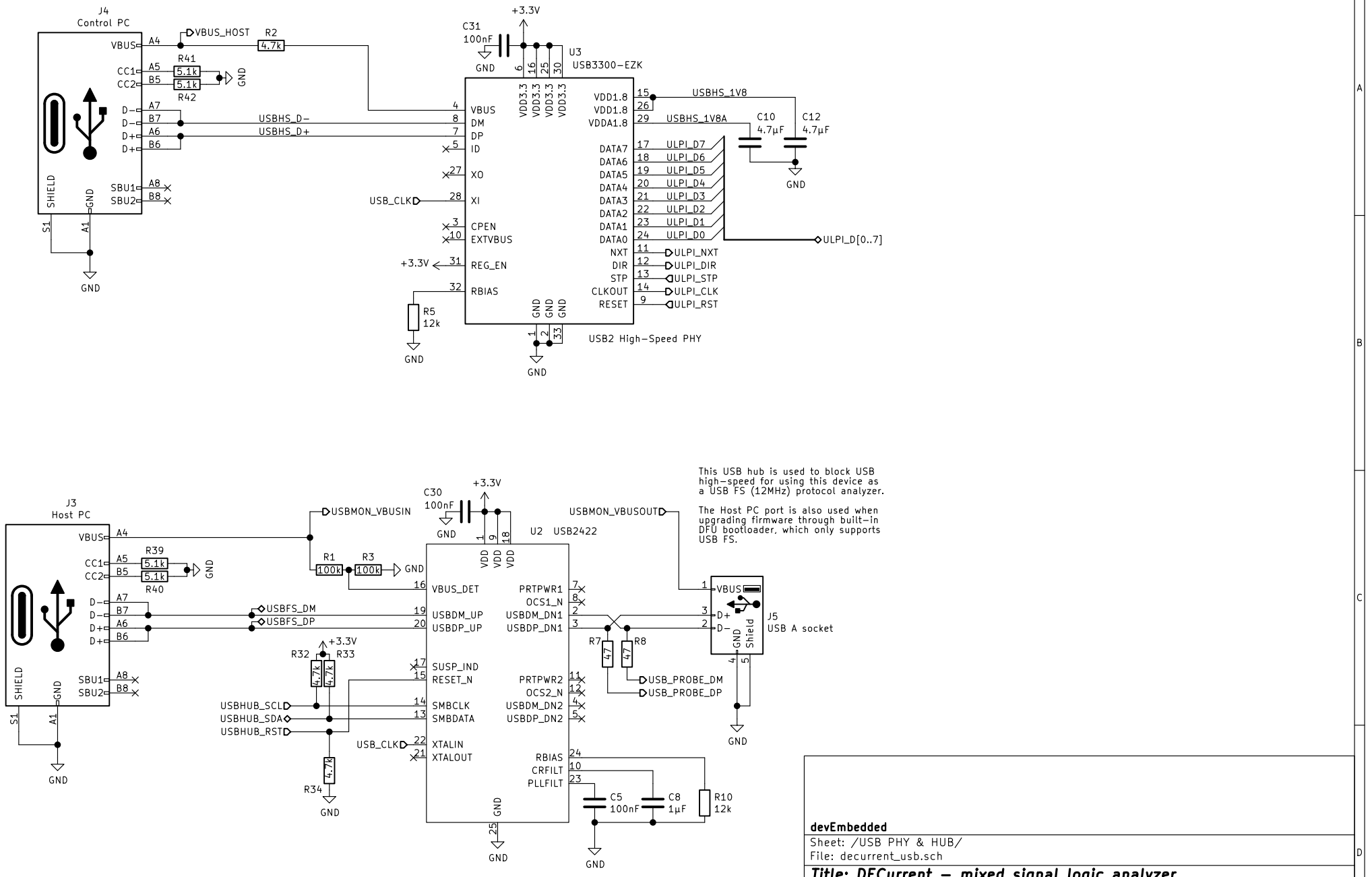
Size: A4	Date: 2020−02−08	**Rev: 1**
KiCad E.D.A. kicad 5.0.2−bee76a070ubuntu18.04.1		Id: 3/6

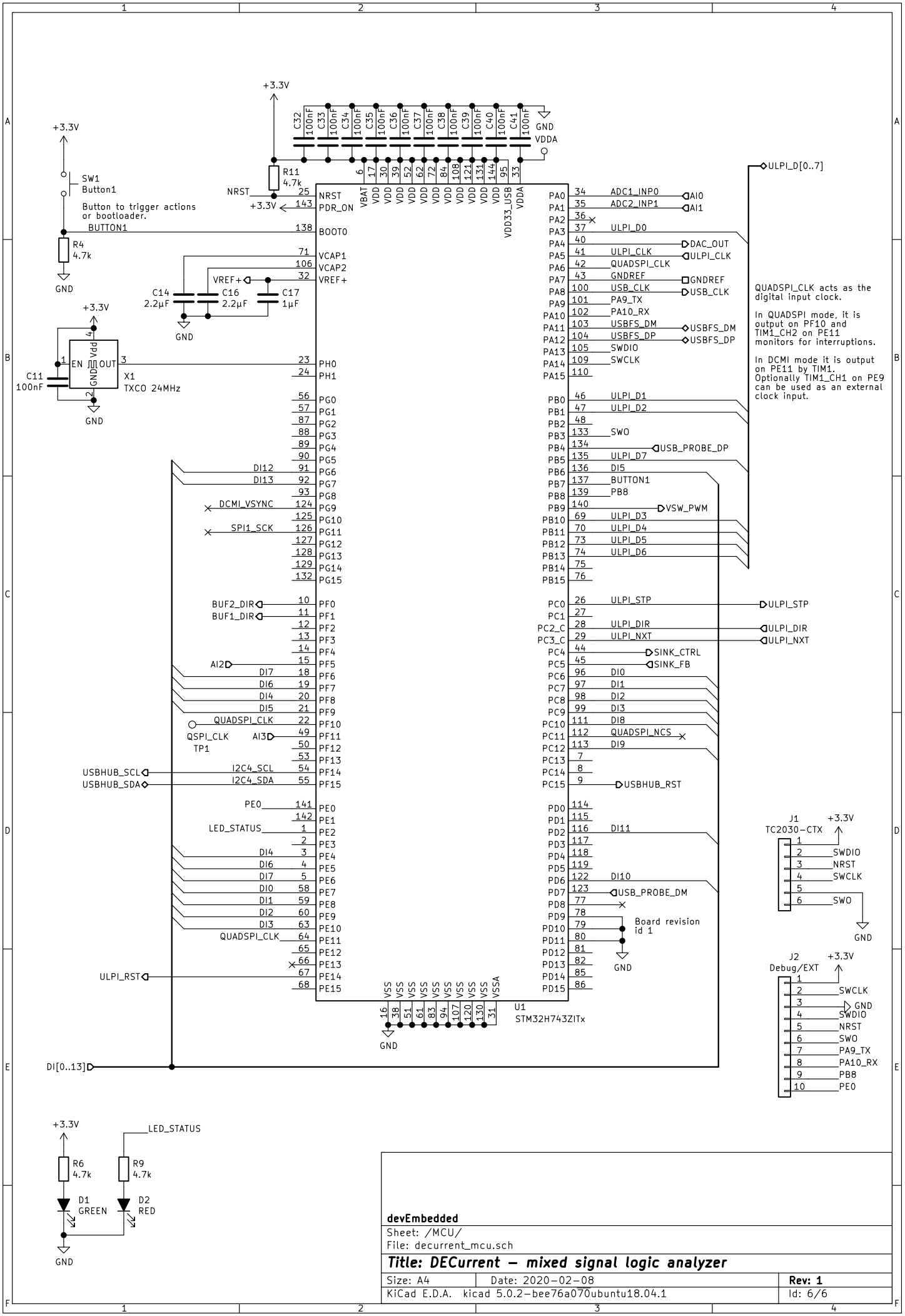






devEmbedded		
Sheet: /Power/ File: decurrent_power.sch		
Title: DECurrent – mixed signal logic analyzer		
Size: A4	Date: 2020-02-08	**Rev: 1**
KiCad E.D.A. kicad 5.0.2-bee76a070ubuntu18.04.1		Id: 4/6


J4
Control PC
VBUS
CC1
CC2
D−
D−
D+
D+
SHIELD
GND
SBU1
SBU2
S1
A1
A4
A5
B5
A7
B7
A6
B6
A8
B8
VBUS_HOST
R2
4.7k
R41
5.1k
R42
5.1k
GND
USBHS_D−
USBHS_D+
C31
100nF
+3.3V
U3
USB3300−EZK
VBUS
DM
DP
ID
XO
XI
CPEN
EXTVBUS
REG_EN
RBIAS
USB_CLK
+3.3V
R5
12k
VDD3.3
VDD3.3
VDD3.3
VDD3.3
GND
GND
GND
VDD1.8
VDD1.8
VDDA1.8
USBHS_1V8
USBHS_1V8A
C10
4.7µF
C12
4.7µF
DATA7
DATA6
DATA5
DATA4
DATA3
DATA2
DATA1
DATA0
ULPI_D7
ULPI_D6
ULPI_D5
ULPI_D4
ULPI_D3
ULPI_D2
ULPI_D1
ULPI_D0
ULPI_D[0..7]
NXT
DIR
STP
CLKOUT
RESET
ULPI_NXT
ULPI_DIR
ULPI_STP
ULPI_CLK
ULPI_RST
USB2 High−Speed PHY
J3
Host PC
USBMON_VBUSIN
C30
100nF
+3.3V
U2 USB2422
R1
100k
R3
100k
R39
5.1k
R40
5.1k
USBFS_DM
USBFS_DP
VBUS_DET
USBDM_UP
USBDP_UP
SUSP_IND
RESET_N
SMBCLK
SMBDATA
XTALIN
XTALOUT
PRTPWR1
OCS1_N
USBDM_DN1
USBDP_DN1
PRTPWR2
OCS2_N
USBDM_DN2
USBDP_DN2
RBIAS
CRFILT
PLLFILT
R32
4.7k
R33
4.7k
R34
4.7k
USBHUB_SCL
USBHUB_SDA
USBHUB_RST
USB_CLK
C5
100nF
C8
1µF
R10
12k
USBMON_VBUSOUT
R7
47
R8
47
USB_PROBE_DM
USB_PROBE_DP
J5
USB A socket
VBUS
D+
D−
GND
Shield
This USB hub is used to block USB high−speed for using this device as a USB FS (12MHz) protocol analyzer.
The Host PC port is also used when upgrading firmware through built−in DFU bootloader, which only supports USB FS.
devEmbedded
Sheet: /USB PHY & HUB/
File: decurrent_usb.sch
Title: DECurrent − mixed signal logic analyzer
Size: A4
Date: 2020−02−08
Rev: 1
KiCad E.D.A. kicad 5.0.2−bee76a070ubuntu18.04.1
Id: 5/6



devEmbedded		
Sheet: /MCU/		
File: decurrent_mcu.sch		
Title: DECurrent – mixed signal logic analyzer		
Size: A4	Date: 2020-02-08	**Rev: 1**
KiCad E.D.A. kicad 5.0.2-bee76a070ubuntu18.04.1		Id: 6/6