VBATT IS 12V BUT CAN GO UP TO 14V

Sheet: FPGA_JTAG_SPECIAL_PWR

File: FPGA_JTAG_SPECIAL_PWR.sch

Sheet: Buzzer_LEDs

File: Buzzer_LEDs.sch

Sheet: AD_CONVERTERS

File: AD_conv.sch

Vbatt

Sheet: FPGA

FPGA

File: FPGA.sch

Sheet: Sensors

fo

50x

fo

4.65x

O2

Diff Press

Flow Press

Pat Press

File: Sensors.sch

Sheet: Power Supplies

+5V

+5V_SENSE

+3V3

+3V3-ALWAYS-ON

USB

+5V

File: Power_Supplies.sch

Key Pad

Display

BUF

Sheet: JTAG

BUF

JMPR

BUF

FTDI
JTAG

USB-JTAG

Sheet: Microcontroller

USB

JTAG

MCU

File: JTAG.sch

File: Microcontroller.sch

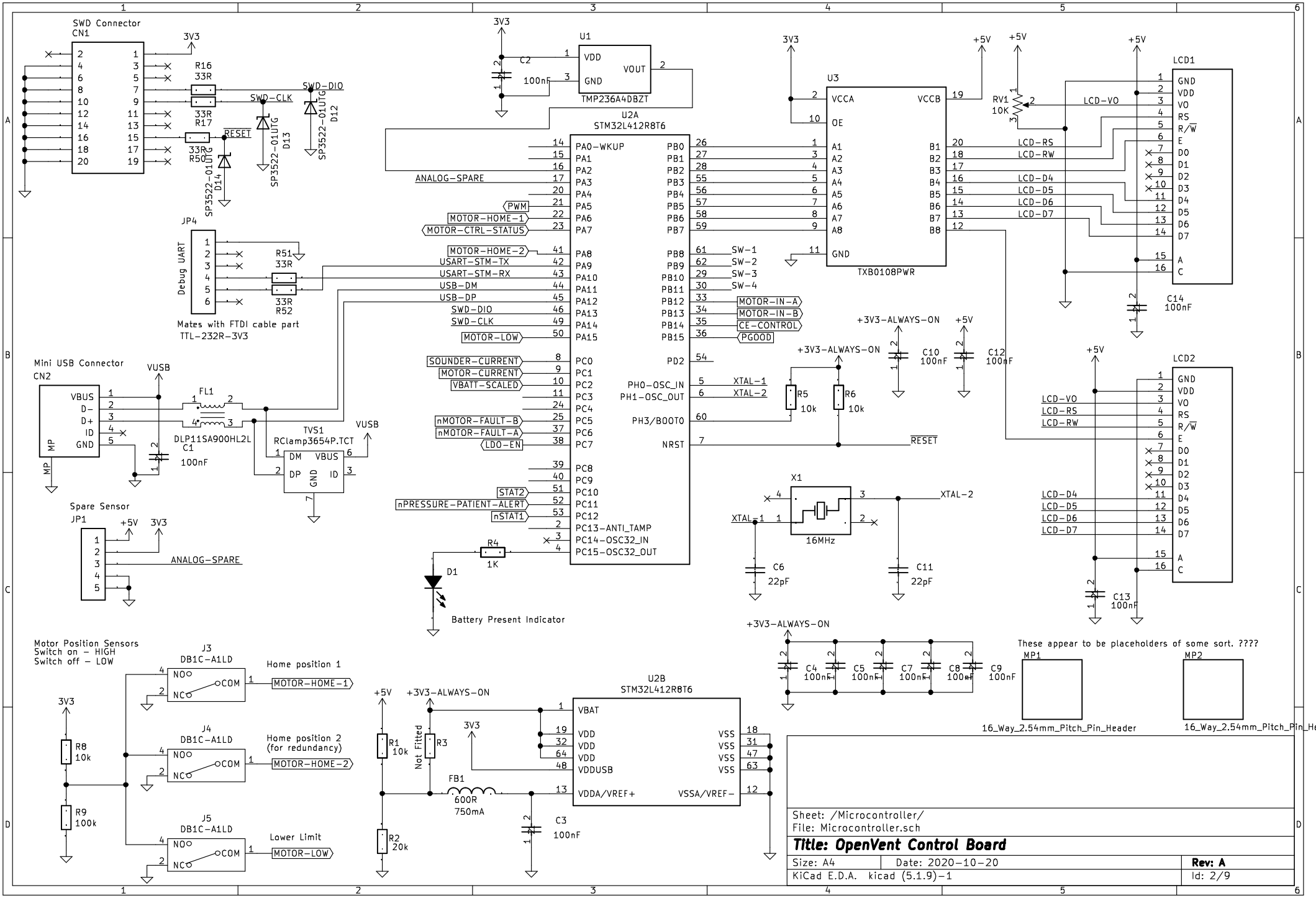
SWD

UART

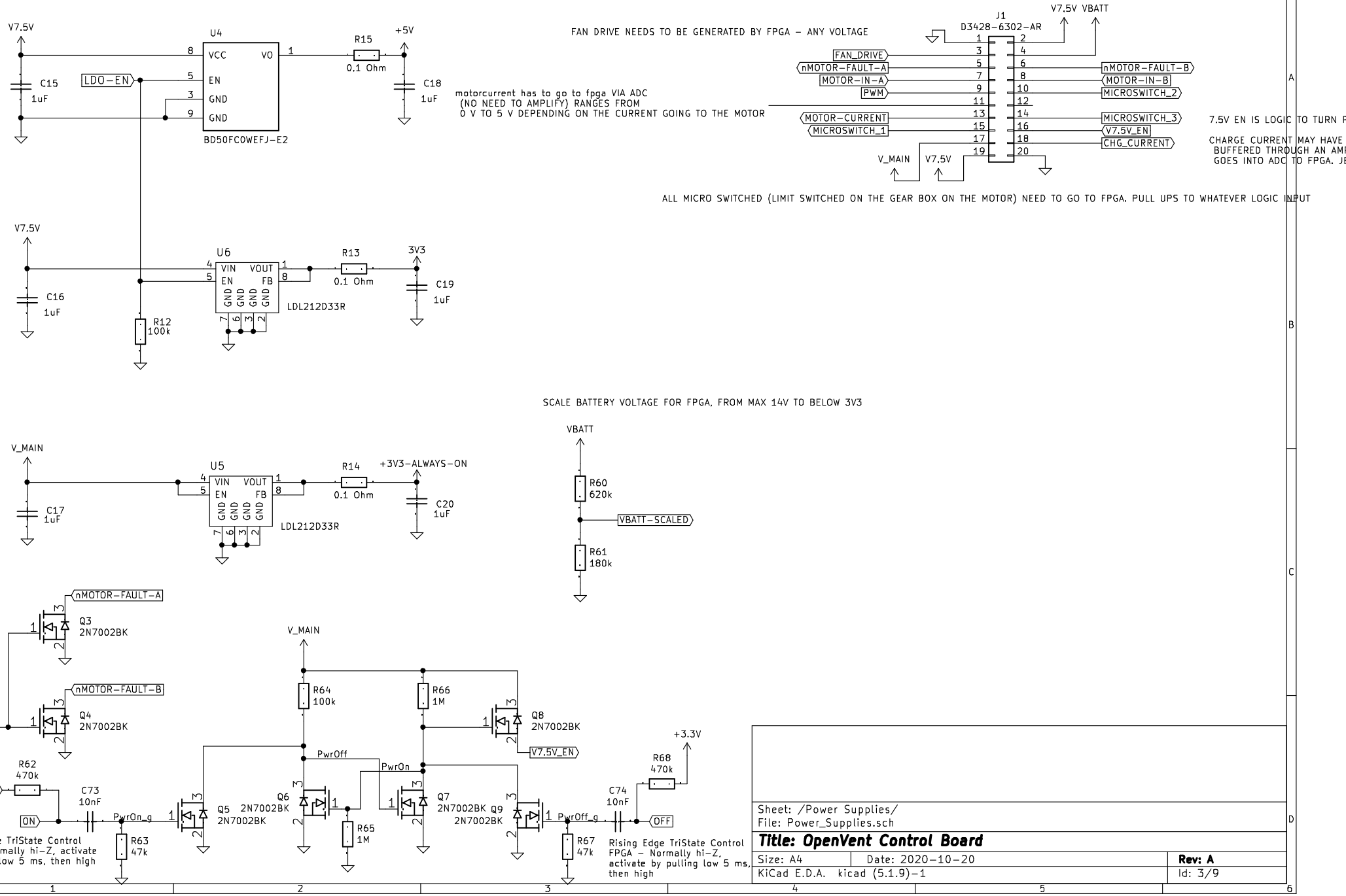
Sheet: /
File: OpenVent.sch

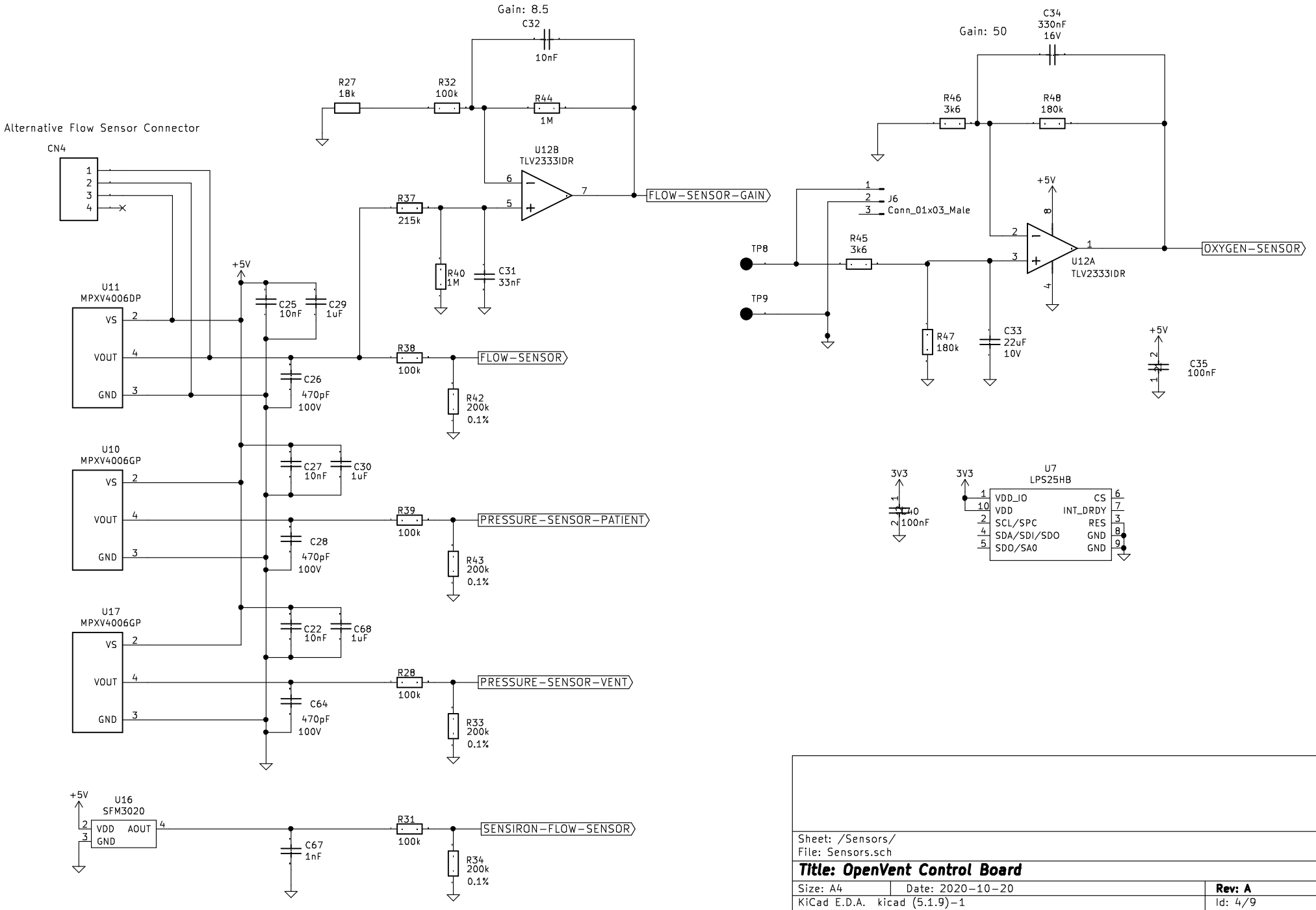
Title: OpenVent Control Board

Size: A3	Date: 2020-10-20	**Rev: A**
KiCad E.D.A. kicad (5.1.9)-1		Id: 1/9



VBATT DOESN'T NEED TO GO INTO MCU IF GOING INTO FPGA
OXYGEN SENSOR MAYBE DOENS'T NEED TO GO TO MCU?


V7.5V
U4
VCC
VO
EN
GND
GND
LDO-EN
C15
1uF
BD50FC0WEFJ-E2
R15
0.1 Ohm
+5V
C18
1uF
FAN DRIVE NEEDS TO BE GENERATED BY FPGA - ANY VOLTAGE
motorcurrent has to go to fpga VIA ADC
(NO NEED TO AMPLIFY) RANGES FROM
0 V TO 5 V DEPENDING ON THE CURRENT GOING TO THE MOTOR
J1
D3428-6302-AR
V7.5V VBATT
FAN_DRIVE
nMOTOR-FAULT-A
MOTOR-IN-A
PWM
MOTOR-CURRENT
MICROSWITCH_1
nMOTOR-FAULT-B
MOTOR-IN-B
MICROSWITCH_2
MICROSWITCH_3
V7.5V_EN
CHG_CURRENT
V_MAIN
V7.5V
7.5V EN IS LOGIC TO TURN F
CHARGE CURRENT MAY HAVE
BUFFERED THROUGH AN AM
GOES INTO ADC TO FPGA. JE
ALL MICRO SWITCHED (LIMIT SWITCHED ON THE GEAR BOX ON THE MOTOR) NEED TO GO TO FPGA. PULL UPS TO WHATEVER LOGIC INPUT
V7.5V
U6
VIN
VOUT
EN
FB
GND
LDL212D33R
C16
1uF
R12
100k
R13
0.1 Ohm
3V3
C19
1uF
SCALE BATTERY VOLTAGE FOR FPGA, FROM MAX 14V TO BELOW 3V3
V_MAIN
U5
LDL212D33R
C17
1uF
R14
0.1 Ohm
+3V3-ALWAYS-ON
C20
1uF
VBATT
R60
620k
VBATT-SCALED
R61
180k
nMOTOR-FAULT-A
Q3
2N7002BK
From FPGA
nMOTOR-FAULT-B
Motor_Off
Q4
2N7002BK
V_MAIN
R64
100k
R66
1M
Q8
2N7002BK
V7.5V_EN
PwrOff
PwrOn
+3.3V
R68
470k
R62
470k
V3.3_always
C73
10nF
ON
PwrOn_g
Q5
2N7002BK
Q6
2N7002BK
R65
1M
Q7
2N7002BK
Q9
2N7002BK
PwrOff_g
C74
10nF
OFF
R63
47k
R67
47k
Rising Edge TriState Control
MCU - Normally hi-Z, activate
by pulling low 5 ms, then high
Rising Edge TriState Control
FPGA - Normally hi-Z,
activate by pulling low 5 ms,
then high
Sheet: /Power Supplies/
File: Power_Supplies.sch
Title: OpenVent Control Board
Size: A4
Date: 2020-10-20
Rev: A
KiCad E.D.A. kicad (5.1.9)-1
Id: 3/9

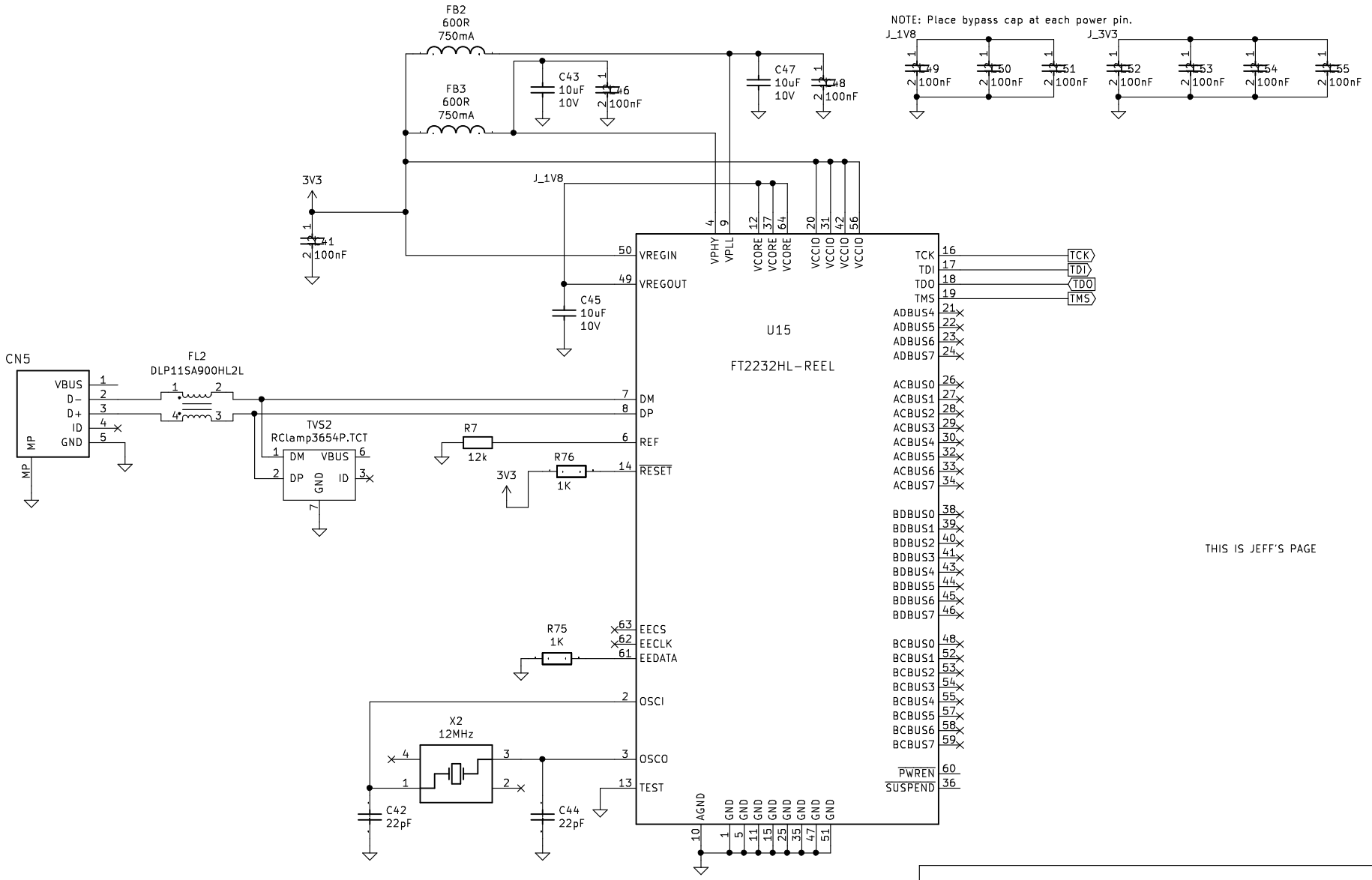


Sheet: /Sensors/
File: Sensors.sch

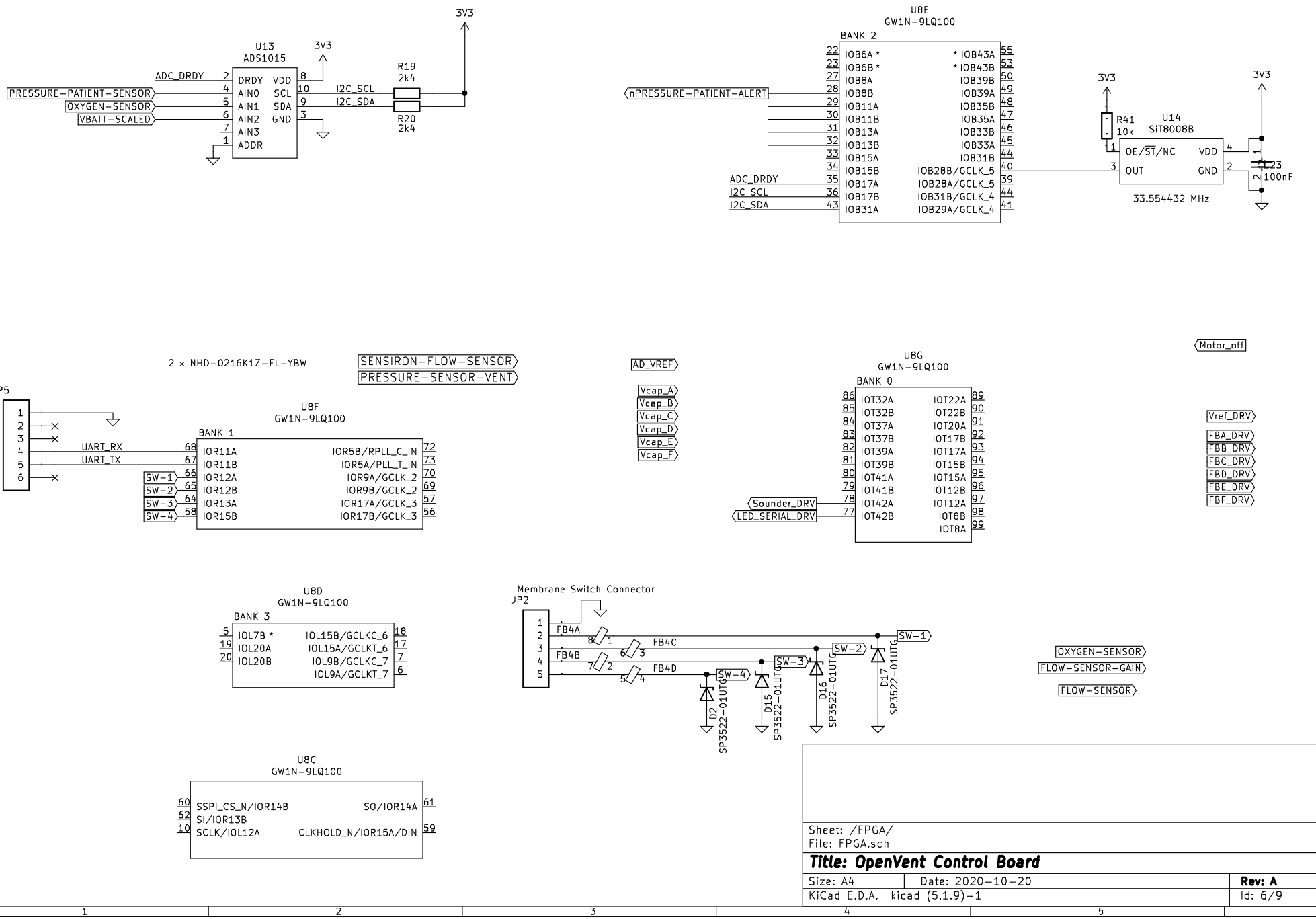
Title: OpenVent Control Board

Size: A4	Date: 2020-10-20	**Rev: A**
KiCad E.D.A. kicad (5.1.9)-1		Id: 4/9

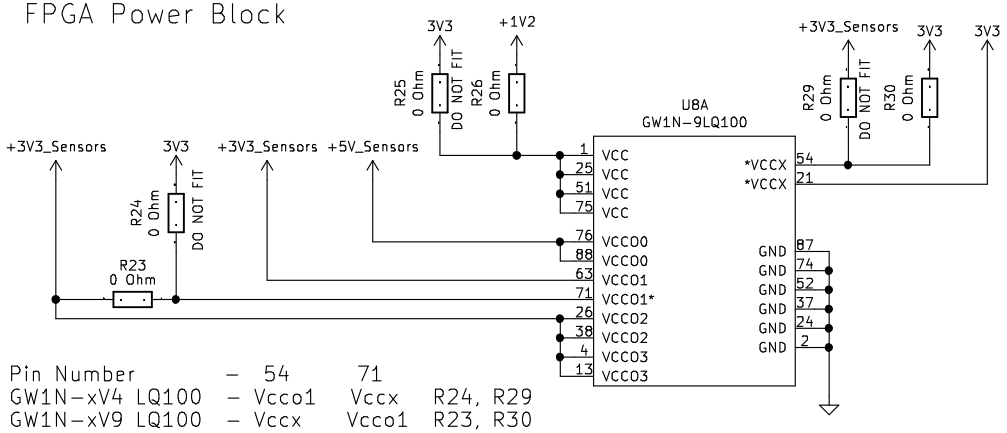
This page is prepared for the FPGA power supply aswell as the JTAG USB interface



Sheet: /JTAG/		
File: JTAG.sch		
Title: OpenVent Control Board		
Size: A4	Date: 2020-10-20	**Rev: A**
KiCad E.D.A. kicad (5.1.9)-1		Id: 5/9


U13
ADS1015
3V3
ADC_DRDY
PRESSURE-PATIENT-SENSOR
OXYGEN-SENSOR
VBATT-SCALED
DRDY
AIN0
AIN1
AIN2
AIN3
ADDR
VDD
SCL
SDA
GND
I2C_SCL
I2C_SDA
R19
2k4
R20
2k4
U8E
GW1N-9LQ100
BANK 2
nPRESSURE-PATIENT-ALERT
ADC_DRDY
I2C_SCL
I2C_SDA
IOB6A *
IOB6B *
IOB8A
IOB8B
IOB11A
IOB11B
IOB13A
IOB13B
IOB15A
IOB15B
IOB17A
IOB17B
IOB31A
* IOB43A
* IOB43B
IOB39B
IOB39A
IOB35B
IOB35A
IOB33B
IOB33A
IOB31B
IOB28B/GCLK_5
IOB28A/GCLK_5
IOB31B/GCLK_4
IOB29A/GCLK_4
R41
10k
U14
SiT8008B
OE/ST/NC
OUT
VDD
GND
33.554432 MHz
C23
100nF
2 × NHD-0216K1Z-FL-YBW
SENSIRON-FLOW-SENSOR
PRESSURE-SENSOR-VENT
JP5
Debug UART
U8F
GW1N-9LQ100
BANK 1
UART_RX
UART_TX
SW-1
SW-2
SW-3
SW-4
IOR11A
IOR11B
IOR12A
IOR12B
IOR13A
IOR15B
IOR5B/RPLL_C_IN
IOR5A/PLL_T_IN
IOR9A/GCLK_2
IOR9B/GCLK_2
IOR17A/GCLK_3
IOR17B/GCLK_3
AD_VREF
Vcap_A
Vcap_B
Vcap_C
Vcap_D
Vcap_E
Vcap_F
U8G
GW1N-9LQ100
BANK 0
Sounder_DRV
LED_SERIAL_DRV
IOT32A
IOT32B
IOT37A
IOT37B
IOT39A
IOT39B
IOT41A
IOT41B
IOT42A
IOT42B
IOT22A
IOT22B
IOT20A
IOT17B
IOT17A
IOT15B
IOT15A
IOT12B
IOT12A
IOT8B
IOT8A
Motor_off
Vref_DRV
FBA_DRV
FBB_DRV
FBC_DRV
FBD_DRV
FBE_DRV
FBF_DRV
U8D
GW1N-9LQ100
BANK 3
IOL7B *
IOL20A
IOL20B
IOL15B/GCLKC_6
IOL15A/GCLKT_6
IOL9B/GCLKC_7
IOL9A/GCLKT_7
Membrane Switch Connector
JP2
FB4A
FB4B
FB4C
FB4D
D2
SP3522-01UTG
D15
SP3522-01UTG
D16
SP3522-01UTG
D17
SP3522-01UTG
OXYGEN-SENSOR
FLOW-SENSOR-GAIN
FLOW-SENSOR
U8C
GW1N-9LQ100
SSPI_CS_N/IOR14B
SI/IOR13B
SCLK/IOL12A
SO/IOR14A
CLKHOLD_N/IOR15A/DIN
Sheet: /FPGA/
File: FPGA.sch
Title: OpenVent Control Board
Size: A4
Date: 2020-10-20
Rev: A
KiCad E.D.A. kicad (5.1.9)-1
Id: 6/9

FPGA Power Block

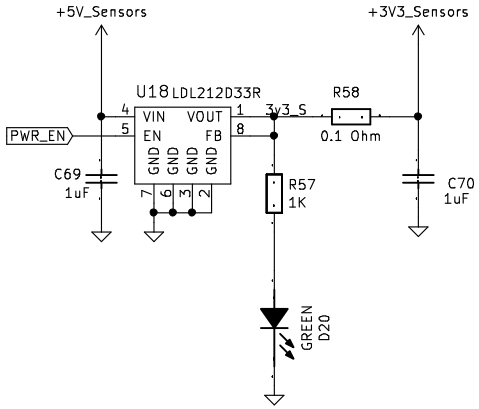


Pin Number – 54 71
GW1N-xV4 LQ100 – Vcco1 Vccx R24, R29
GW1N-xV9 LQ100 – Vccx Vcco1 R23, R30

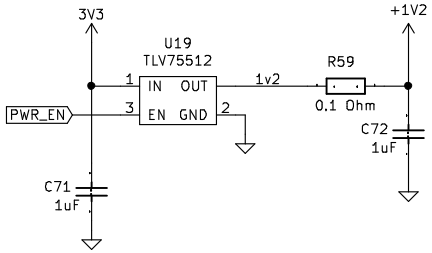
Pins 54 and 71 are swapped between the -4 and -9 FPGA devices.

Add R25 and omit R26 when using GW1N-UV device

+5V to 3V3 LDO for ADC and 3V3 sensors

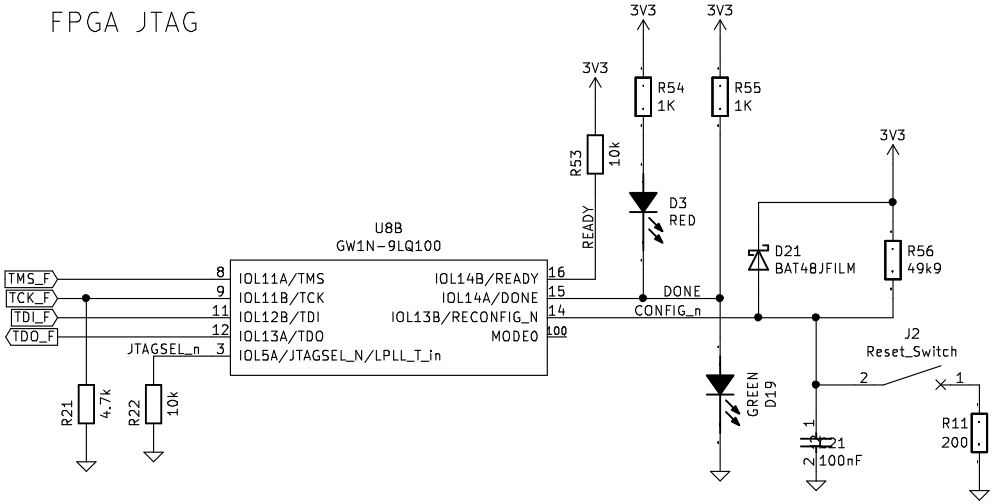


3V3 to 1.2 LDO for VCC

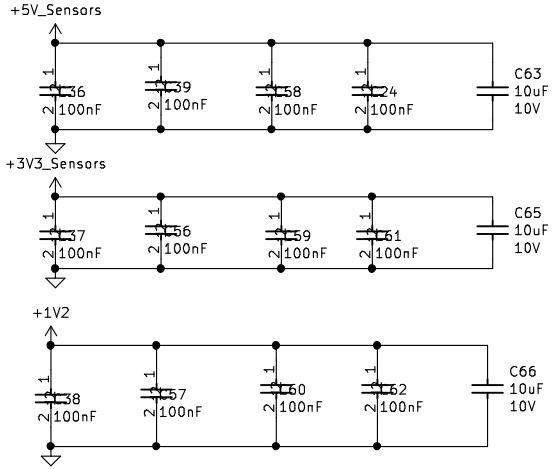


Optional Circuit to use with GW1N-LV4 or GW1N-LV9 device. With GW1N-UV4 or GW1N-UV9 devices omit this circuit and R26 and add R25

FPGA JTAG



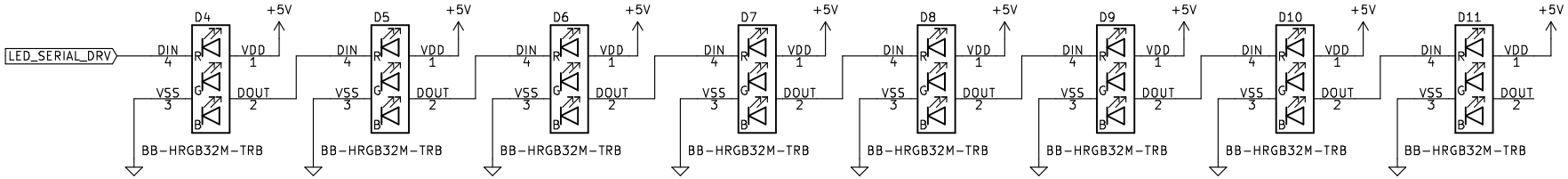
Bypass Caps for Power Block



Sheet: /FPGA JTAG SPECIAL PWR/
File: FPGA_JTAG_SPECIAL_PWR.sch

Title:

Size: A4	Date:	**Rev:**
KiCad E.D.A. kicad (5.1.9)-1		Id: 7/9



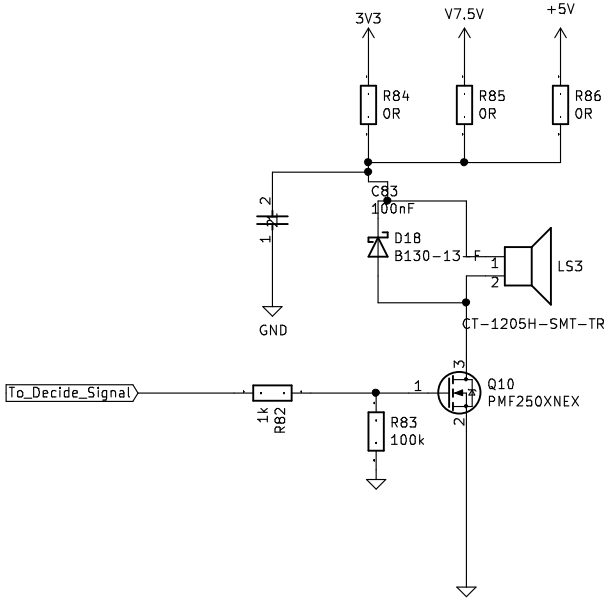
Sounder current, what is it? feedback signal that indigates that the beeper is working. We need to know what that signal looks like and the figure out what we do with it

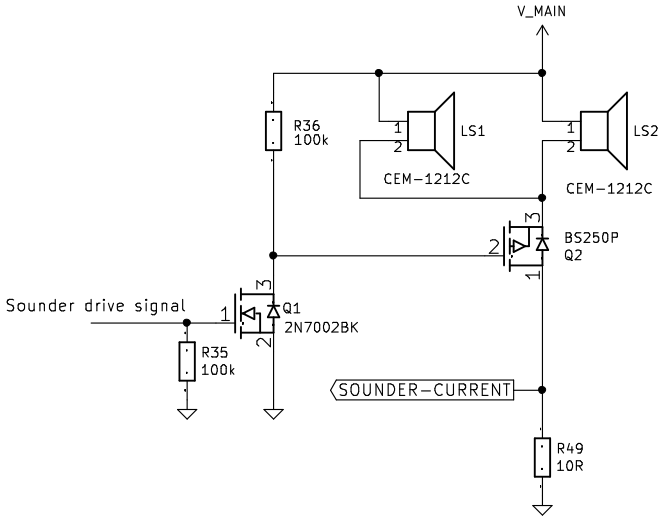
sounder drive is ggoing to be 3v3 or 5v

Put a 100nF on the end and one in the middle

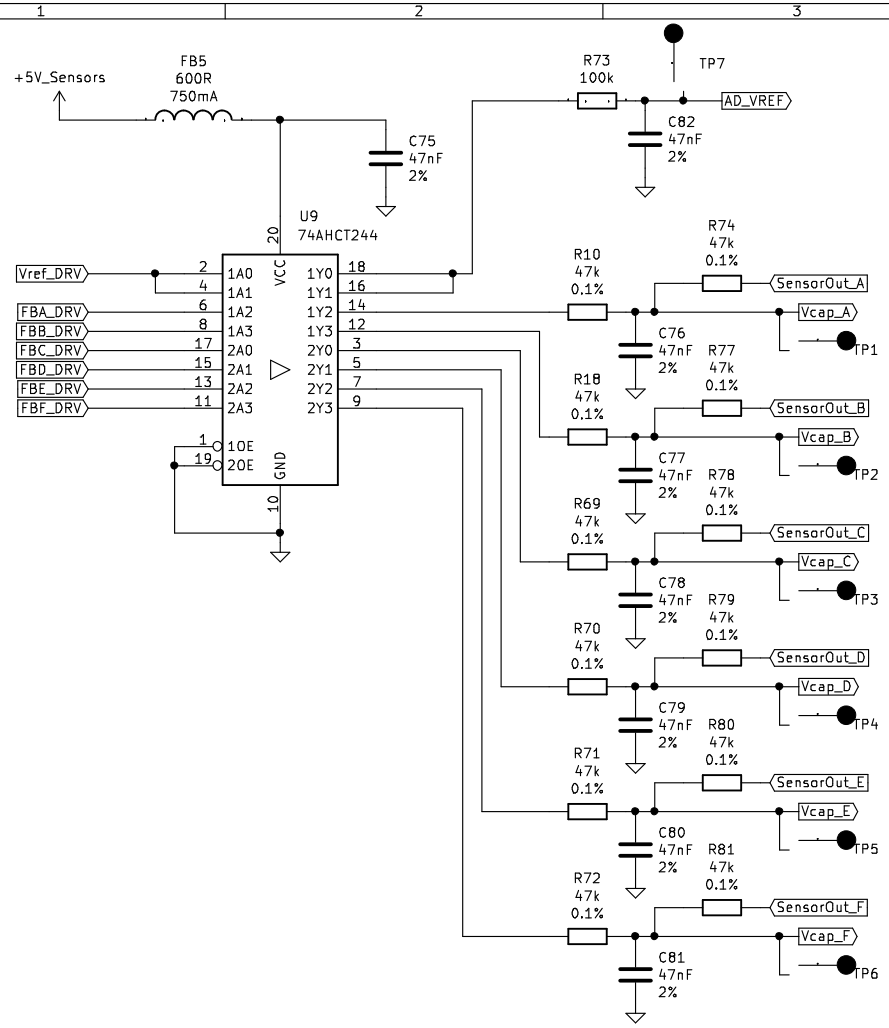
Sounder drive will be global thing too, comingf from the FPGA

Sounder current coming into pin 8 on the micro





Sheet: /Buzzer_LEDs/ File: Buzzer_LEDs.sch		
Title:		
Size: A4	Date:	**Rev:**
KiCad E.D.A. kicad (5.1.9)-1		Id: 8/9



Sheet: /AD CONVERTERS/
File: AD_conv.sch

Title:

Size: A4	Date:	**Rev:**
KiCad E.D.A. kicad (5.1.9)-1		Id: 9/9