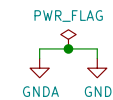
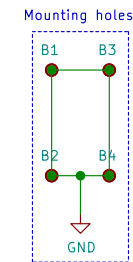
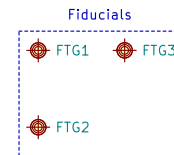
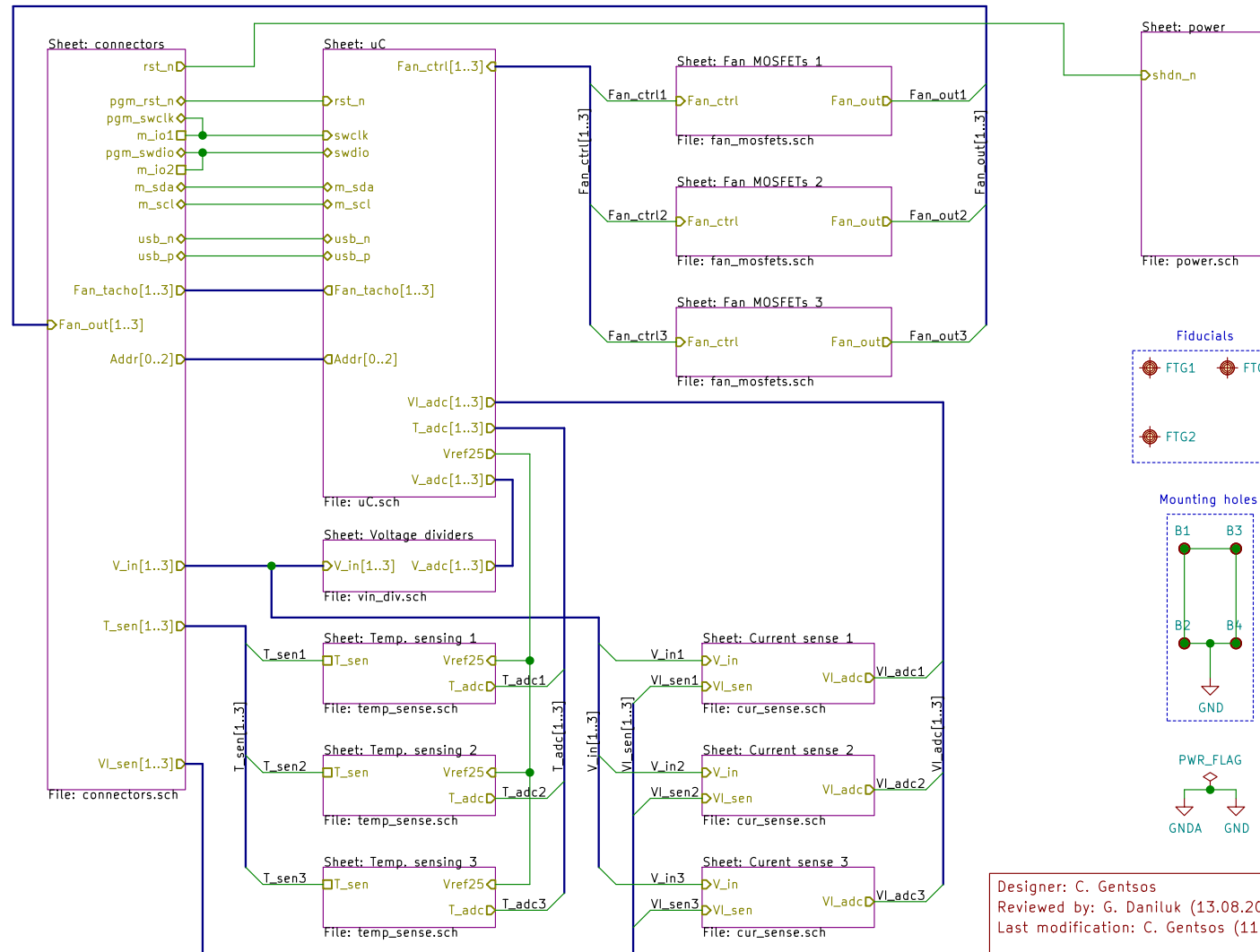


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the reset signal
 found at the main connector
 power cycles reg

IN	OUT
5V	3.3V
	5V, filtered for analog
	3.3V, filtered for analog



Designer: C. Gentsos
 Reviewed by: G. Daniluk (13.08.2019)
 Last modification: C. Gentsos (11.03.2020)

CERN, European Organization for Nuclear Research, CH–1211 Genève 23 – Switzerland

Sheet: /
 File: monimod.sch

Title: DIOT Monitoring Module (MoniMod) Prototype

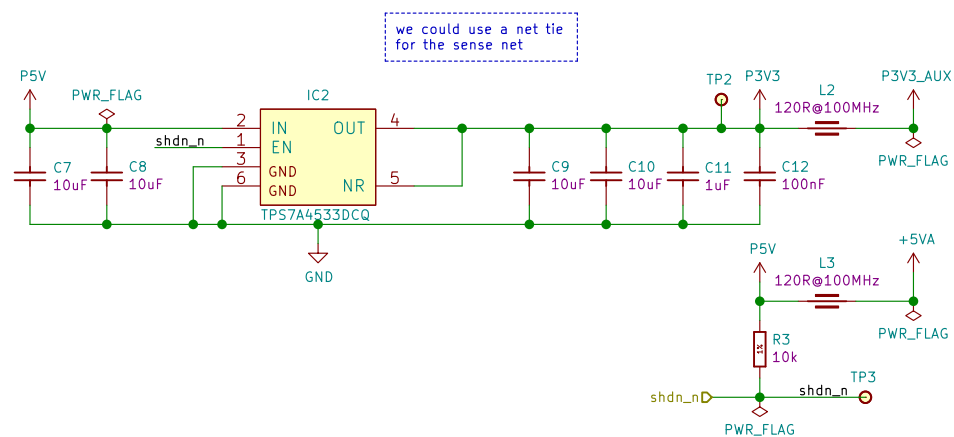
Size: A4 Date: 2019–10–28

KiCad E.D.A. kicad 5.1.6

Rev: 0.2p

Id: 1/14

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Designer: C. Gentsos
 Reviewed by: G. Daniluk (13.08.2019)
 Last modification: C. Gentsos (11.03.2020)

CERN, European Organization for Nuclear Research, CH–1211 Genève 23 – Switzerland

Sheet: /power/
 File: power.sch

Title: Power regulators

Size: A4 Date: 2019–10–28

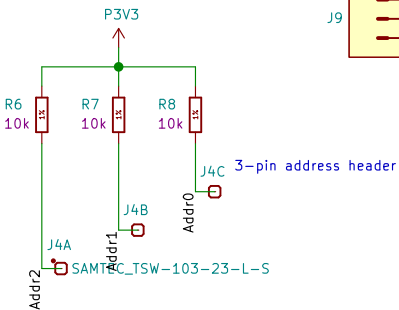
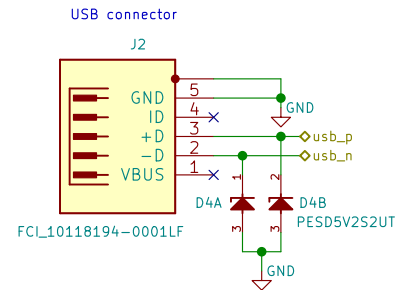
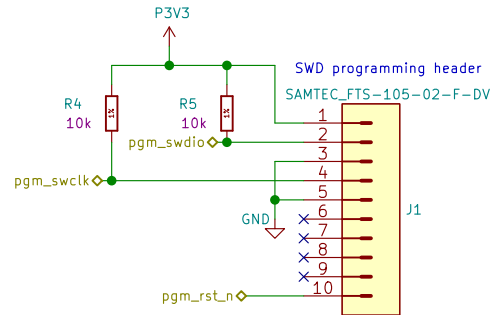
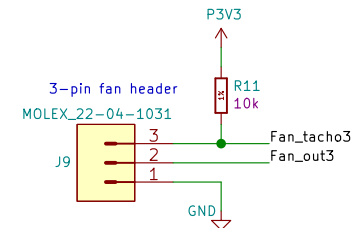
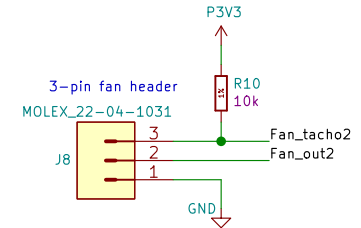
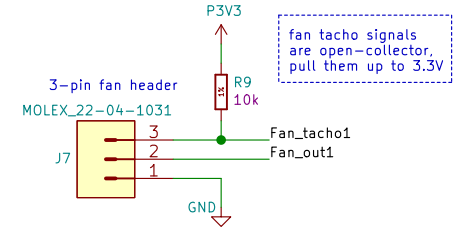
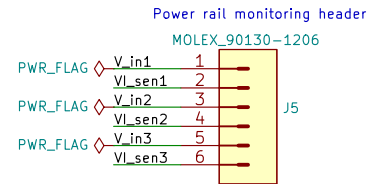
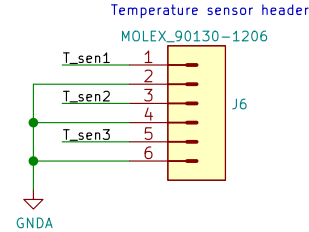
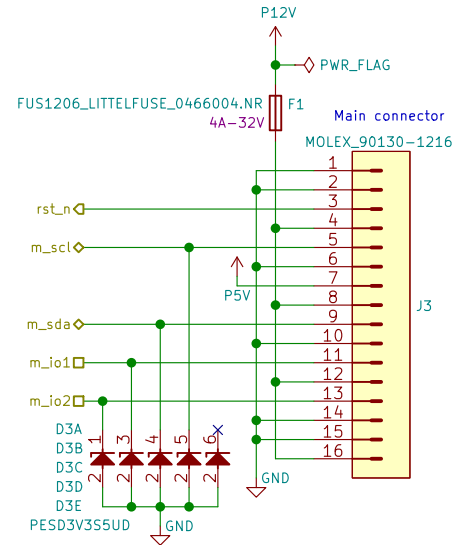
KiCad E.D.A. kicad 5.1.6

Rev: 0.2p

Id: 2/14

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Addr[0..2] → Addr[0..2]
 V_in[1..3] → V_in[1..3]
 VI_sen[1..3] → VI_sen[1..3]
 T_sen[1..3] → T_sen[1..3]
 Fan_out[1..3] → Fan_out[1..3]
 Fan_tacho[1..3] → Fan_tacho[1..3]



Designer: C. Gentsos
 Reviewed by: G. Daniluk (13.08.2019)
 Last modification: C. Gentsos (30.06.2020)

CERN, European Organization for Nuclear Research, CH–1211 Genève 23 – Switzerland

Sheet: /connectors/
 File: connectors.sch

Title: Board connectors

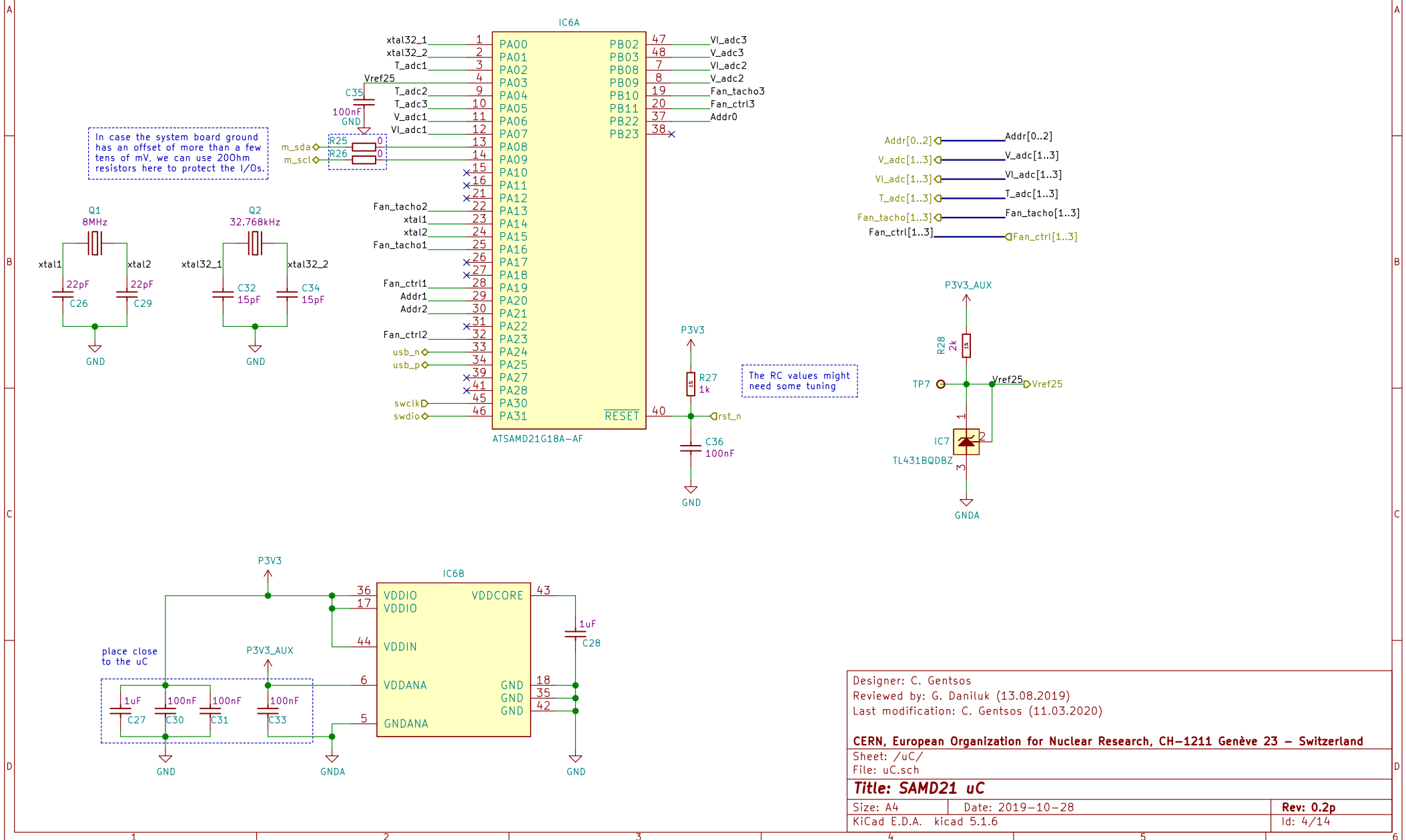
Size: A4 Date: 2019–10–28

KiCad E.D.A. kicad 5.1.6

Rev: 0.2p

Id: 3/14

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Designer: C. Gentsos
Reviewed by: G. Daniluk (13.08.2019)
Last modification: C. Gentsos (11.03.2020)

CERN, European Organization for Nuclear Research, CH–1211 Genève 23 – Switzerland

Sheet: /uC/
File: uC.sch

Title: SAMD21 uC

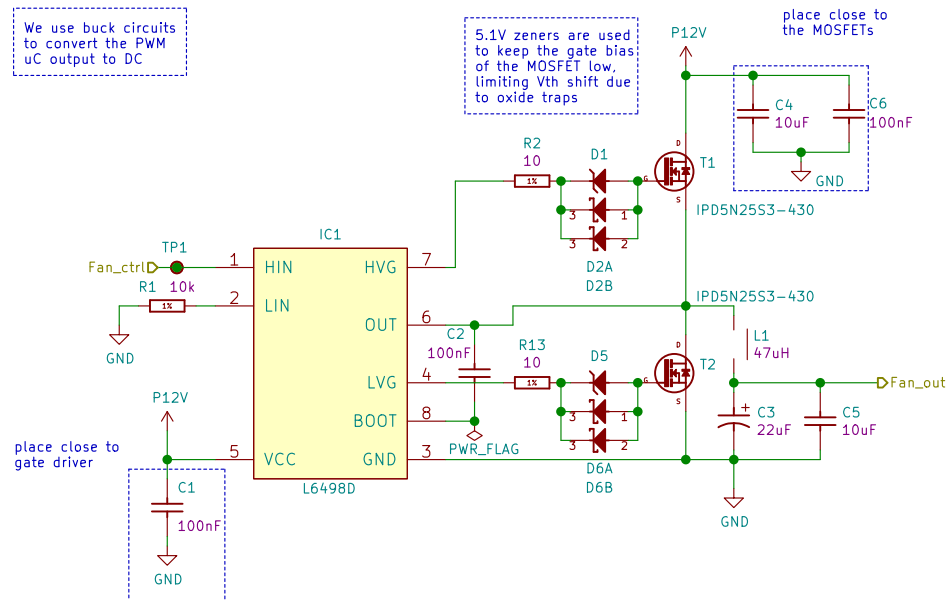
Size: A4	Date: 2019–10–28	Rev: 0.2p
KiCad E.D.A. kicad 5.1.6		Id: 4/14

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We use buck circuits
 to convert the PWM
 uC output to DC

5.1V zeners are used
 to keep the gate bias
 of the MOSFET low,
 limiting Vth shift due
 to oxide traps

place close to
 the MOSFETs



Designer: C. Gentsos
 Reviewed by: G. Daniluk (13.08.2019)
 Last modification: C. Gentsos (30.06.2020)

CERN, European Organization for Nuclear Research, CH–1211 Genève 23 – Switzerland

Sheet: /Fan MOSFETs 1/
 File: fan_mosfets.sch

Title: Fan driving circuitry

Size: A4 Date: 2019–10–28

KiCad E.D.A. kicad 5.1.6

Rev: 0.2p

Id: 5/14

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We use buck circuits to convert the PWM uC output to DC

5.1V zeners are used to keep the gate bias of the MOSFET low, limiting Vth shift due to oxide traps

place close to the MOSFETs

place close to gate driver

Design: C. Gentsos
Reviewed by: G. Daniluk (13.08.2019)
Last modification: C. Gentsos (30.06.2020)

CERN, European Organization for Nuclear Research, CH–1211 Genève 23 – Switzerland
Sheet: /Fan MOSFETs 2/
File: fan_mosfets.sch

Title: Fan driving circuitry

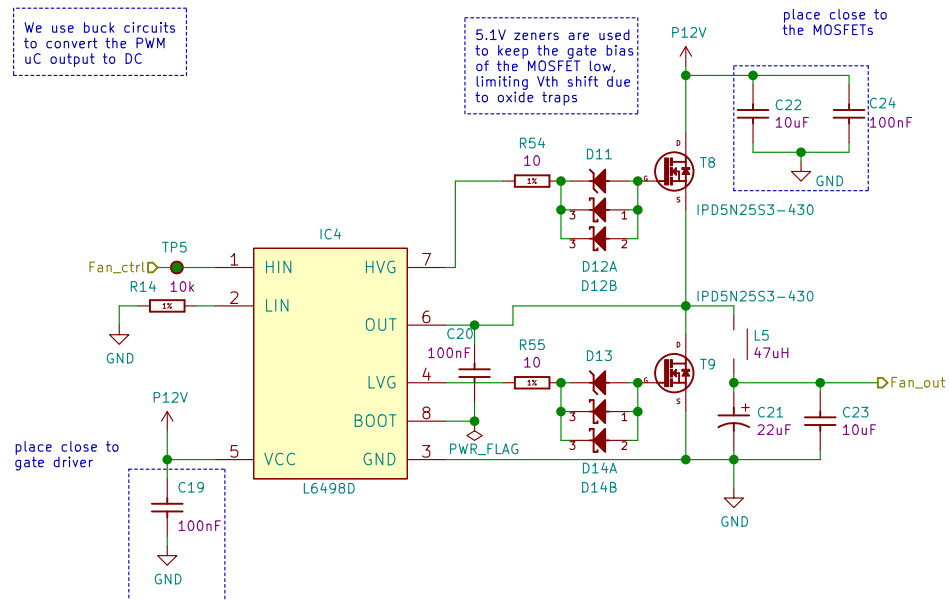
Size: A4	Date: 2019–10–28	Rev: 0.2p
KiCad E.D.A. kicad 5.1.6		Id: 6/14

Id: 6/14

We use buck circuits to convert the PWM uC output to DC

5.1V zeners are used to keep the gate bias of the MOSFET low, limiting V_{th} shift due to oxide traps

place close to
the MOSFETs

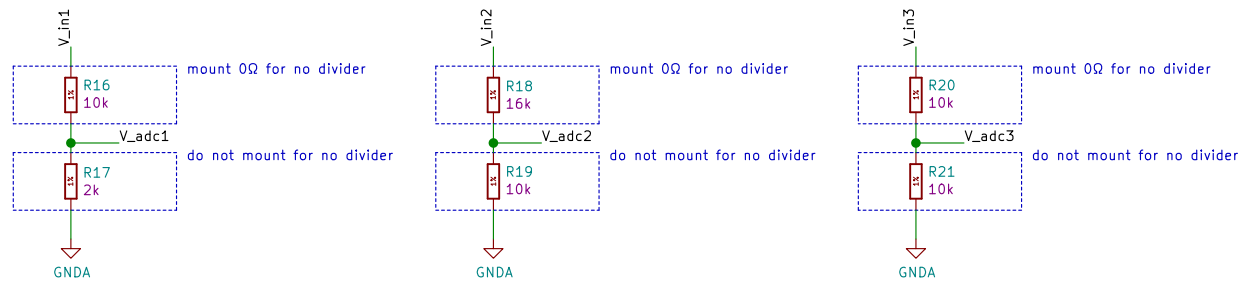


Id: 7/14

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V_in[1..3] \rightarrow V_in[1..3]
 V_adc[1..3] \rightarrow V_adc[1..3]

Note: voltage divider values
 are still somewhat arbitrary,
 precise values TBD



Last modification: C. Gentsos (11.03.2020)

Sheet: /Voltage dividers/
 File: vin_div.sch

Title:

Size: A4

Date:

KiCad E.D.A. kicad 5.1.6

Rev: 0.2p

Id: 8/14

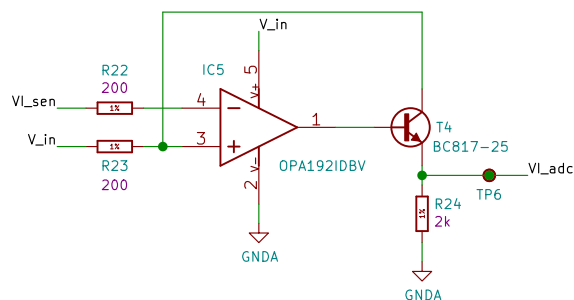
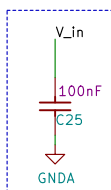
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short description:

The + and - inputs of the opamp will tend to obtain the same value. That will draw some current through the 200Ω resistor at V_{in}. This current will also pass through the output R through the BJT, producing at the output a $V_o = V_{idiff} * R_o / R_i$.

V_{in} → V_{in}
 V_{I_sen} → V_{I_sen}
 V_{I_adc} → V_{I_adc}

place close
to opamps



Last modification: C. Gentsos (11.03.2020)

Sheet: /Current sense 1/
 File: cur_sense.sch

Title:

Size: A4
 KiCad E.D.A. kicad 5.1.6

Date:

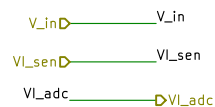
Rev: 0.2p

Id: 9/14

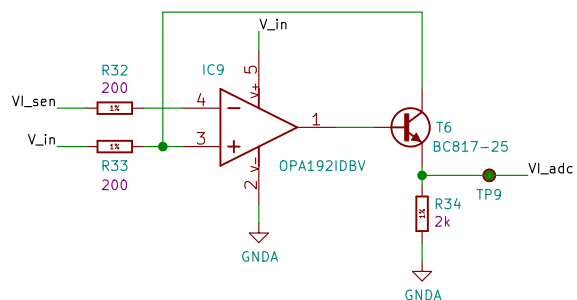
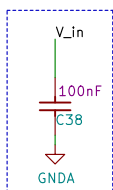
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short description:

The + and - inputs of the opamp will tend to obtain the same value. That will draw some current through the 200Ω resistor at V_{in}. This current will also pass through the output R through the BJT, producing at the output a $V_o = V_{diff} * R_o / R_i$.



place close
to opamps



Last modification: C. Gentsos (11.03.2020)

Sheet: /Current sense 2/
 File: cur_sense.sch

Title:

Size: A4

Date:

KiCad E.D.A. kicad 5.1.6

Rev: 0.2p

Id: 10/14

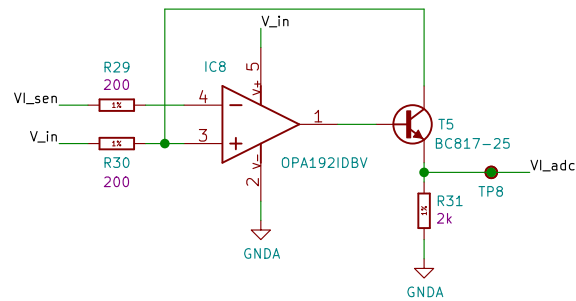
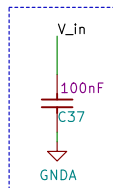
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short description:

The + and – inputs of the opamp will tend to obtain the same value. That will draw some current through the 200Ω resistor at V_{in}. This current will also pass through the output R through the BJT, producing at the output a $V_o = V_{diff} * R_o / R_i$.

V_{in} → V_{in}
 V_{I_sen} → V_{I_sen}
 V_{I_adc} → V_{I_adc}

place close
to opamps



Last modification: C. Gentsos (11.03.2020)

Sheet: /Curent sense 3/
 File: cur_sense.sch

Title:

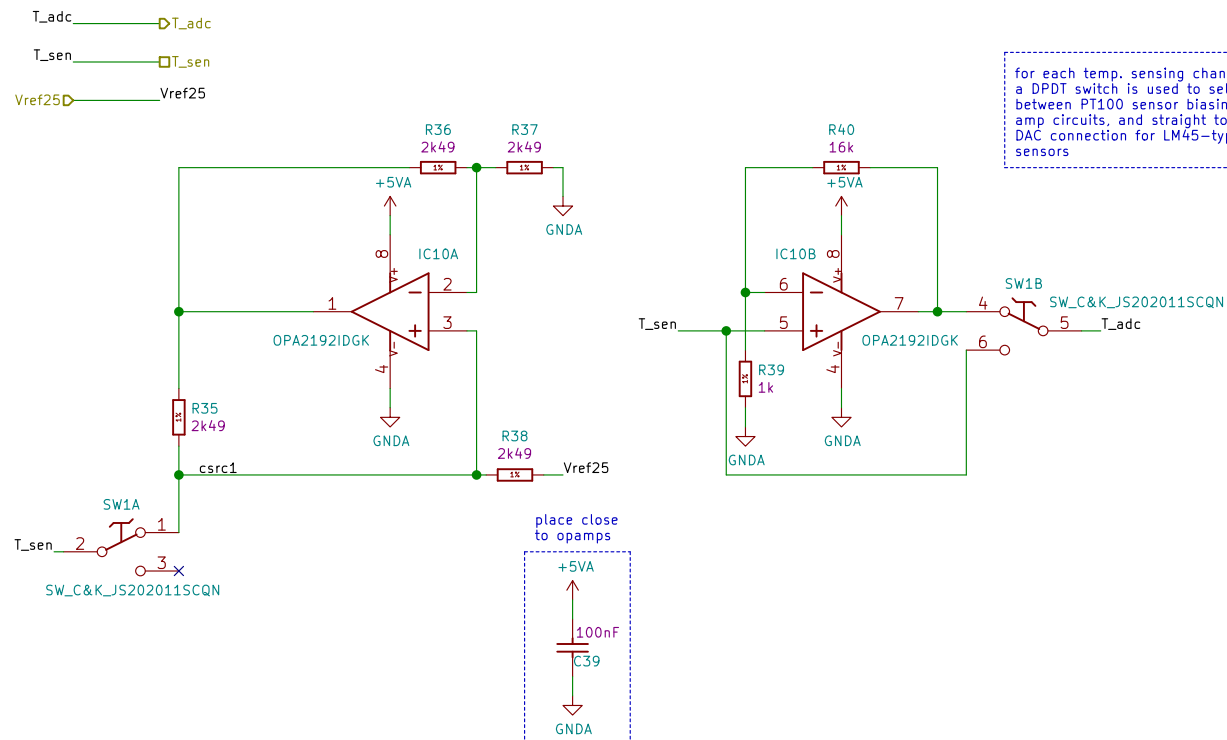
Size: A4
 KiCad E.D.A. kicad 5.1.6

Date:

Rev: 0.2p

Id: 11/14

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Last modification: C. Gentsos (11.03.2020)

Sheet: /Temp. sensing 1/
 File: temp_sense.sch

Title:

Size: A4

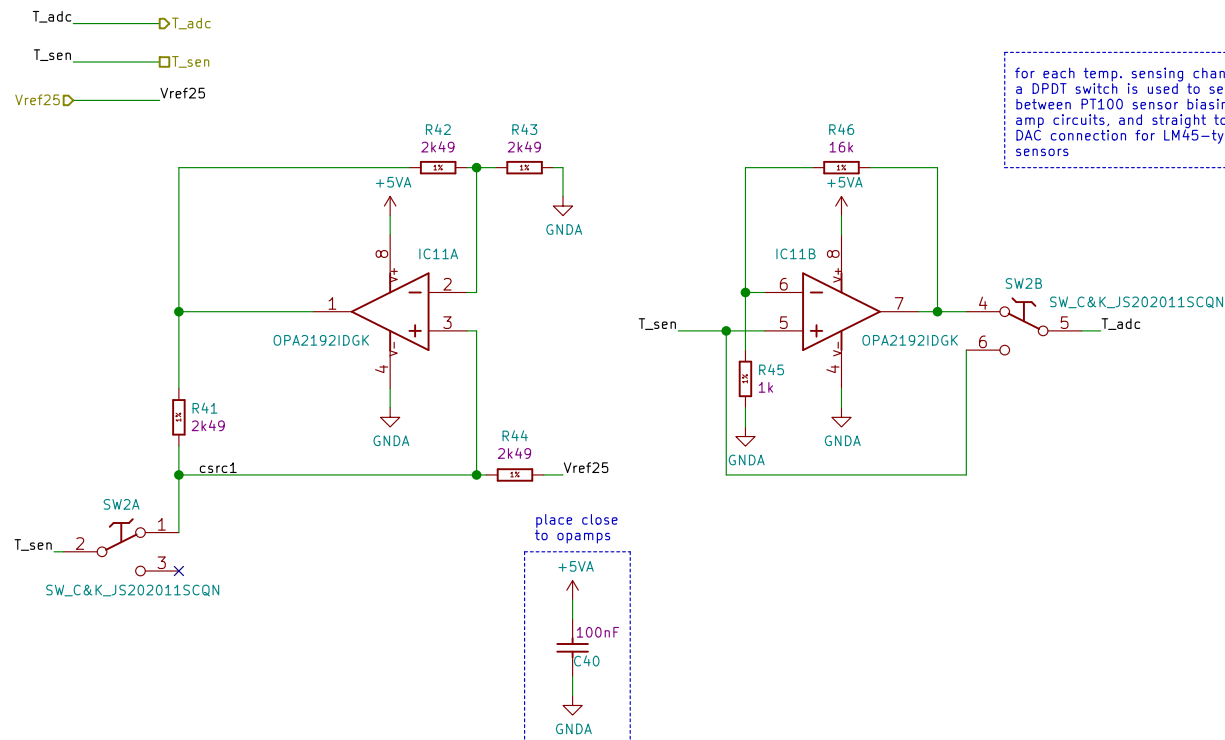
Date:

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Rev: 0.2p

Id: 12/14

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Last modification: C. Gentsos (11.03.2020)

Sheet: /Temp. sensing 2/
 File: temp_sense.sch

Title:

Size: A4

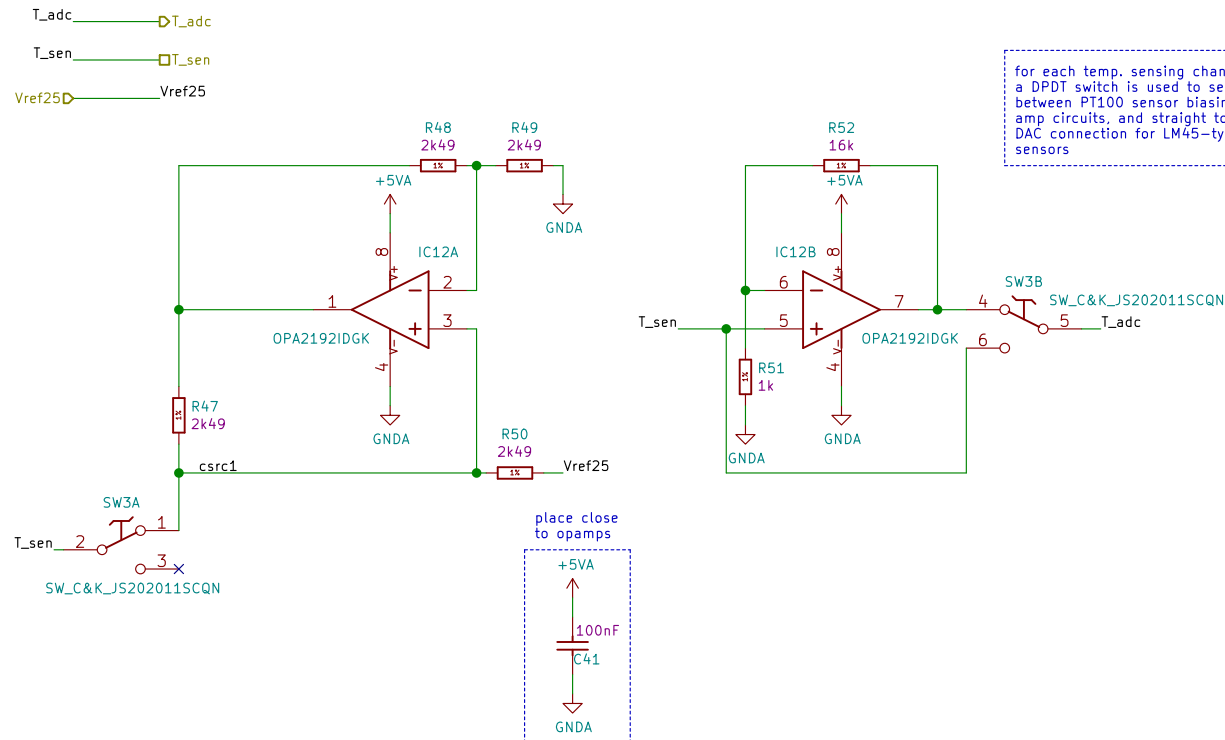
Date:

KiCad E.D.A. kicad 5.1.6

Rev: 0.2p

Id: 13/14

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Last modification: C. Gentsos (11.03.2020)

Sheet: /Temp. sensing 3/
 File: temp_sense.sch

Title:

Size: A4

Date:

KiCad E.D.A. kicad 5.1.6

Rev: 0.2p

Id: 14/14