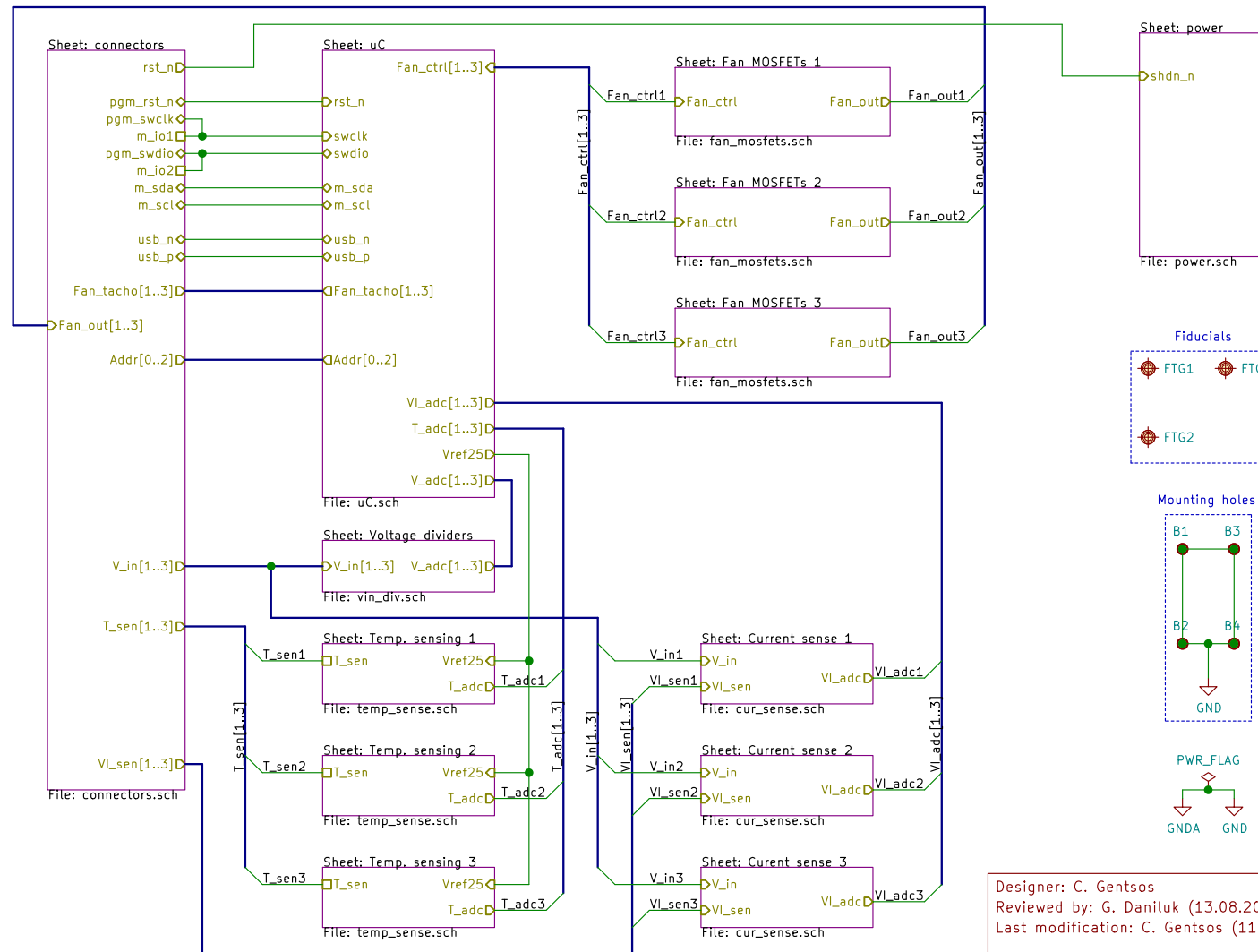


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the reset signal
 found at the main connector
 power cycles reg

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 5.1.5

Rev: 0.2p

Id: 1/14

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

A 18V zener is used to keep the gate bias of the MOSFET low, limiting V_{th} shift due to oxide traps

place close to
the MOSFETs



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

Title: Fan driving circuitry

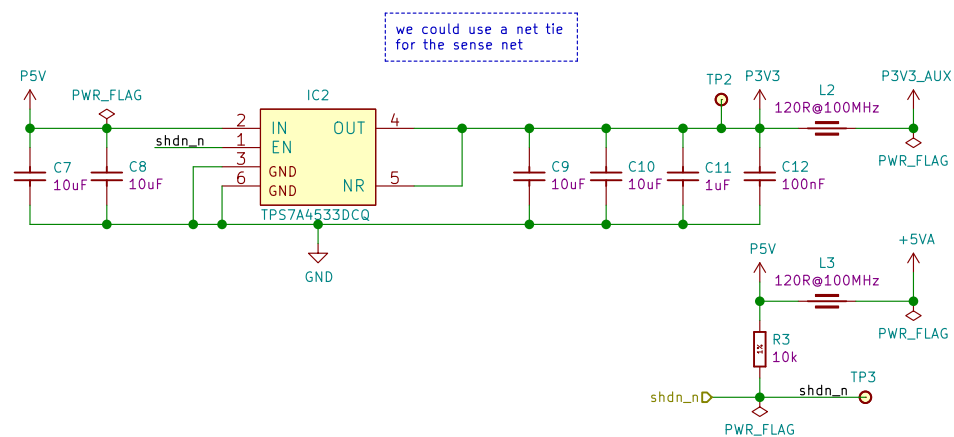
Size: A4	Date: 2019-10-28
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KiCad E.D.A.	kiCad 5.1.5
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Rev: 0.2p

Id: 2/14

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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

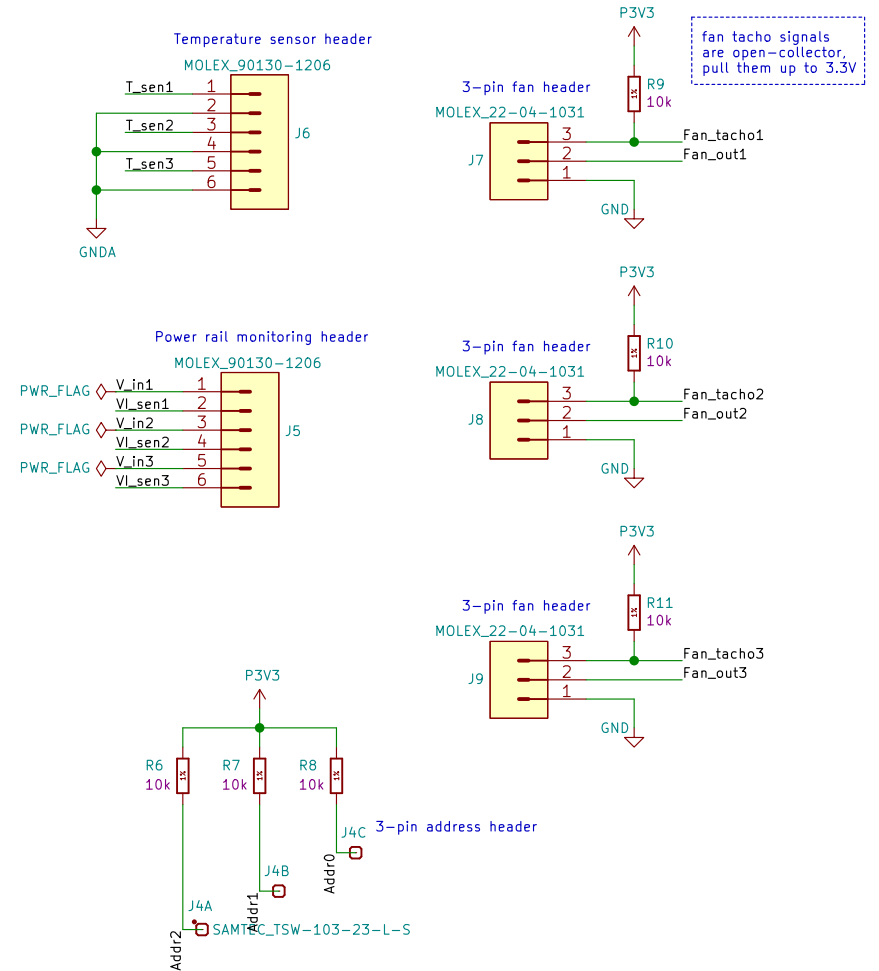
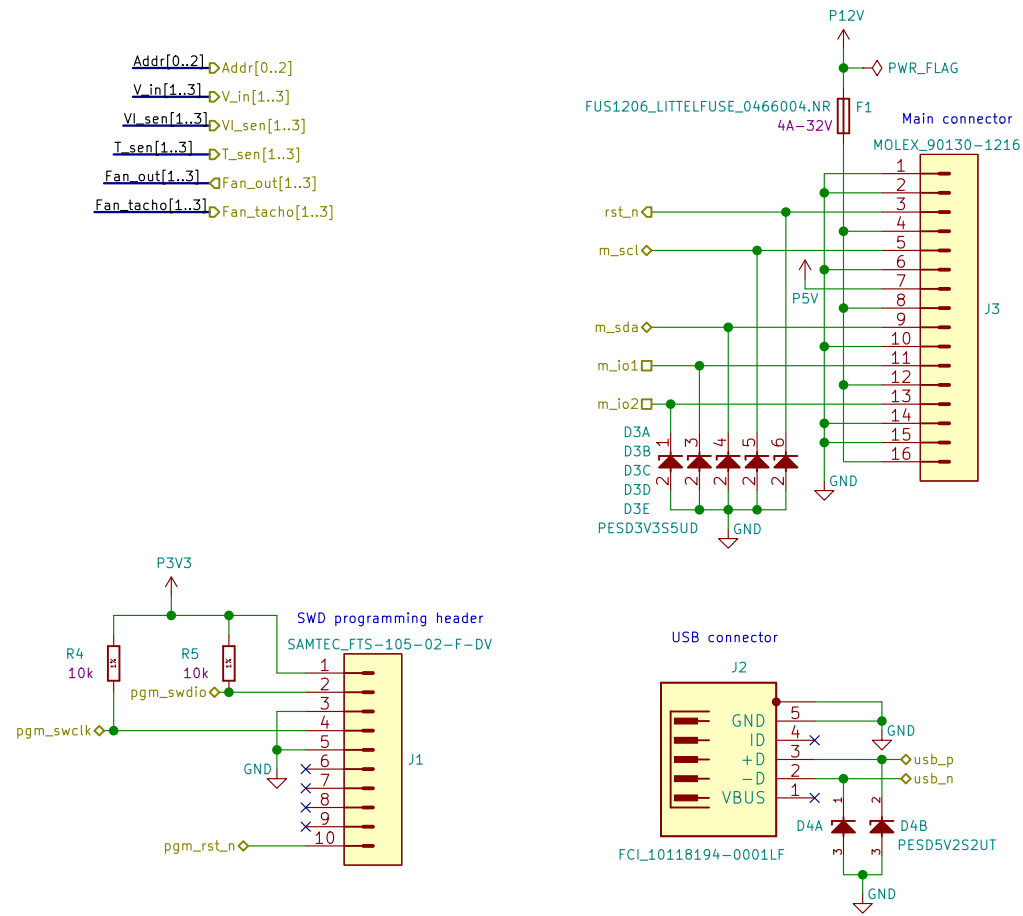
Size: A4 Date: 2019–10–28

KiCad E.D.A. kicad 5.1.5

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: /connectors/
 File: connectors.sch

Title: Board connectors

Size: A4 Date: 2019-10-28

KiCad E.D.A. kicad 5.1.5

Rev: 0.2p

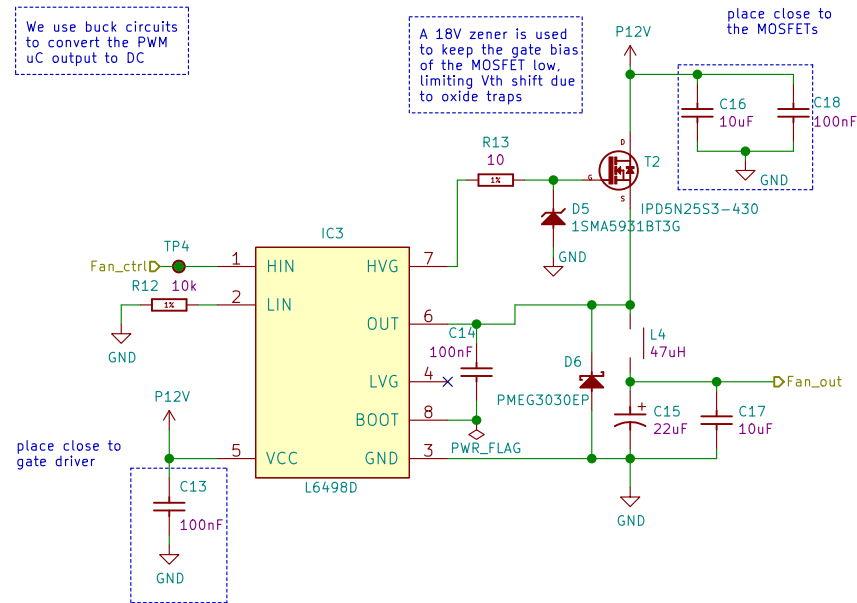
Id: 4/14

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

A 18V zener is 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 (11.03.2020)

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

KiCad E.D.A. kicad 5.1.5

Rev: 0.2p

Id: 5/14

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

A 18V zener is used to keep the gate bias of the MOSFET low, limiting V_{th} shift due to oxide traps

place close to
the MOSFETs



Sheet: /Fan MOSFETs 3/
File: fan_mosfets.sch

Size: A4	Date: 2019-10-28
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KiCad E.D.A.	kicad 5.1.5
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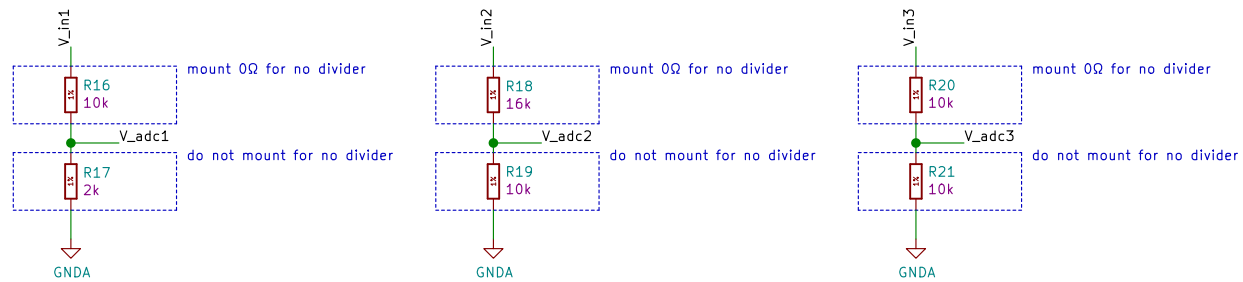
Rev: 0.2p

Id: 6/14

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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 5.1.5

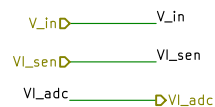
Rev: 0.2p

Id: 7/14

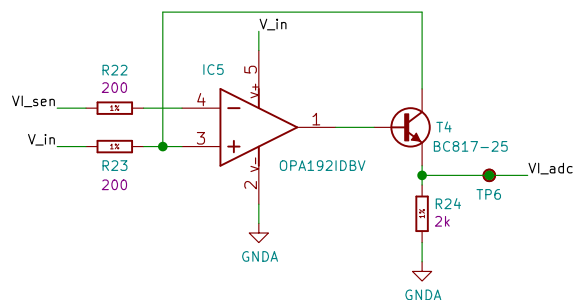
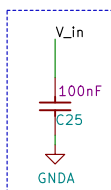
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short description:

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 1/
 File: cur_sense.sch

Title:

Size: A4

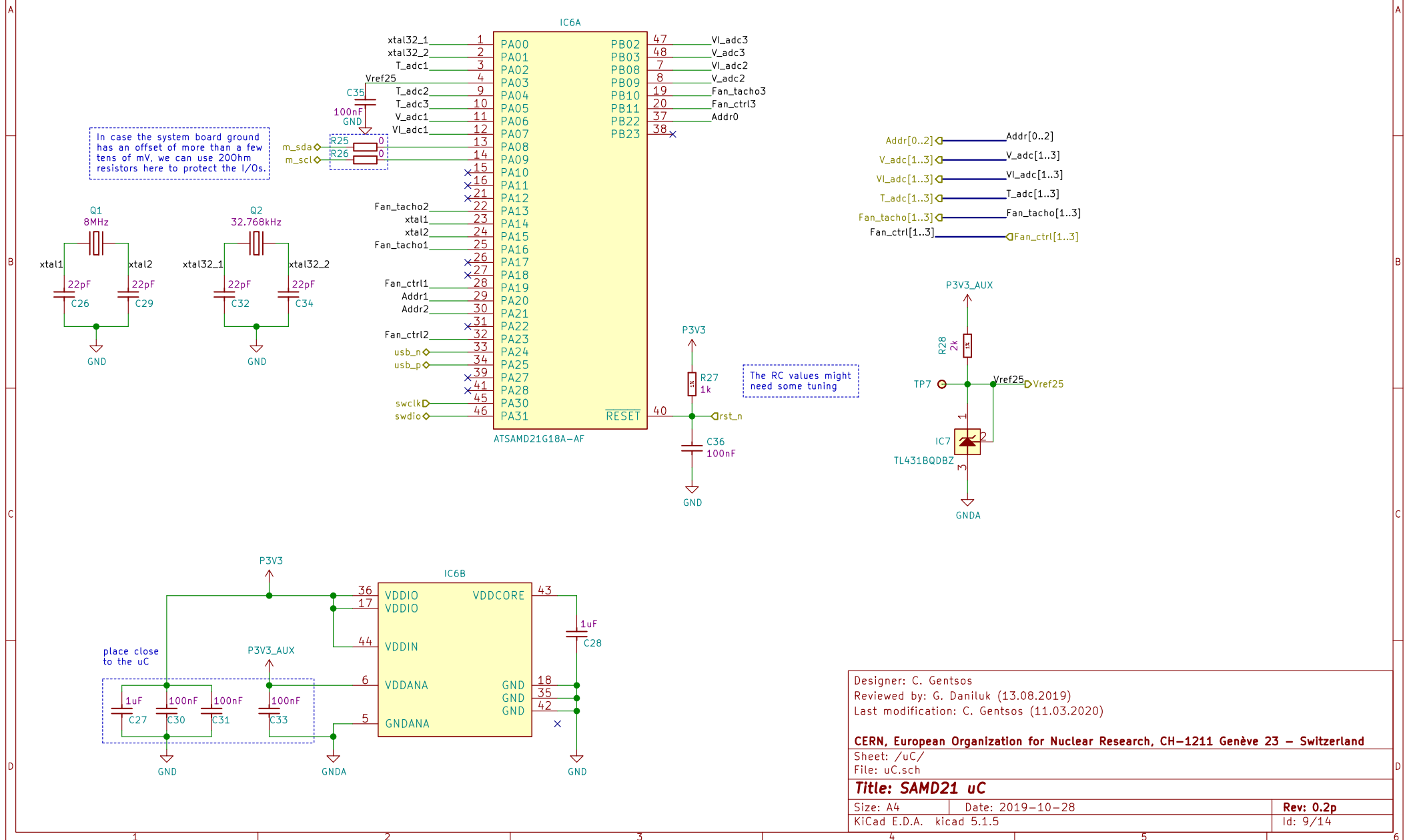
Date:

KiCad E.D.A. kicad 5.1.5

Rev: 0.2p

Id: 8/14

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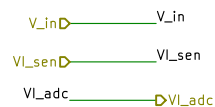


Designer: C. Gentsos		
Reviewed by: G. Daniluk (13.08.2019)		
Last modification: C. Gentsos (11.03.2020)		
CERN, European Organization for Nuclear Research, CH–1211 Genève 23 – Switzerland		
Sheet: /uC/		
File: uC.sch		
Title: SAMD21 uC		
Size: A4	Date: 2019–10–28	Rev: 0.2p
KiCad E.D.A. kicad 5.1.5	Id: 9/14	

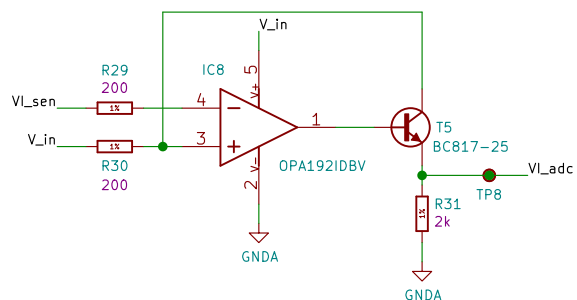
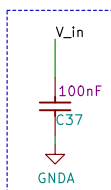
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The + and – inputs of the opamp will tend to obtain the same value. That will draw some current through the 200Ω resistor at V_{in}. This current will also pass through the output R through the BJT, producing at the output a $V_o = V_{diff} * R_o /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



place close
to opamps



Last modification: C. Gentsos (11.03.2020)

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

Title:

Size: A4

Date:

KiCad E.D.A. kicad 5.1.5

Rev: 0.2p

Id: 10/14

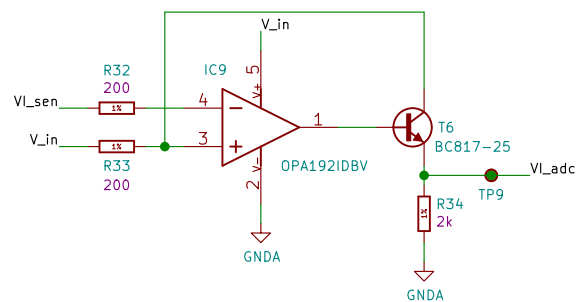
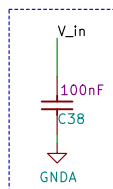
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short description:

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: /Current sense 2/
 File: cur_sense.sch

Title:

Size: A4

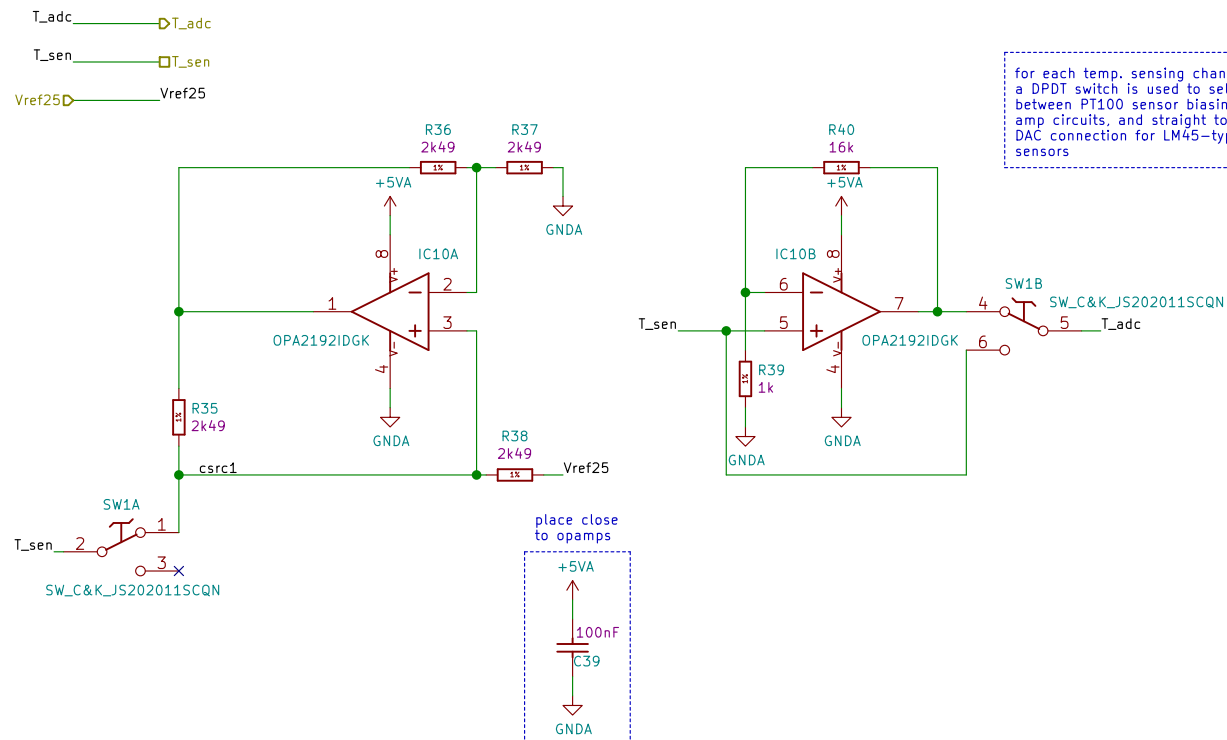
Date:

KiCad E.D.A. kicad 5.1.5

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:

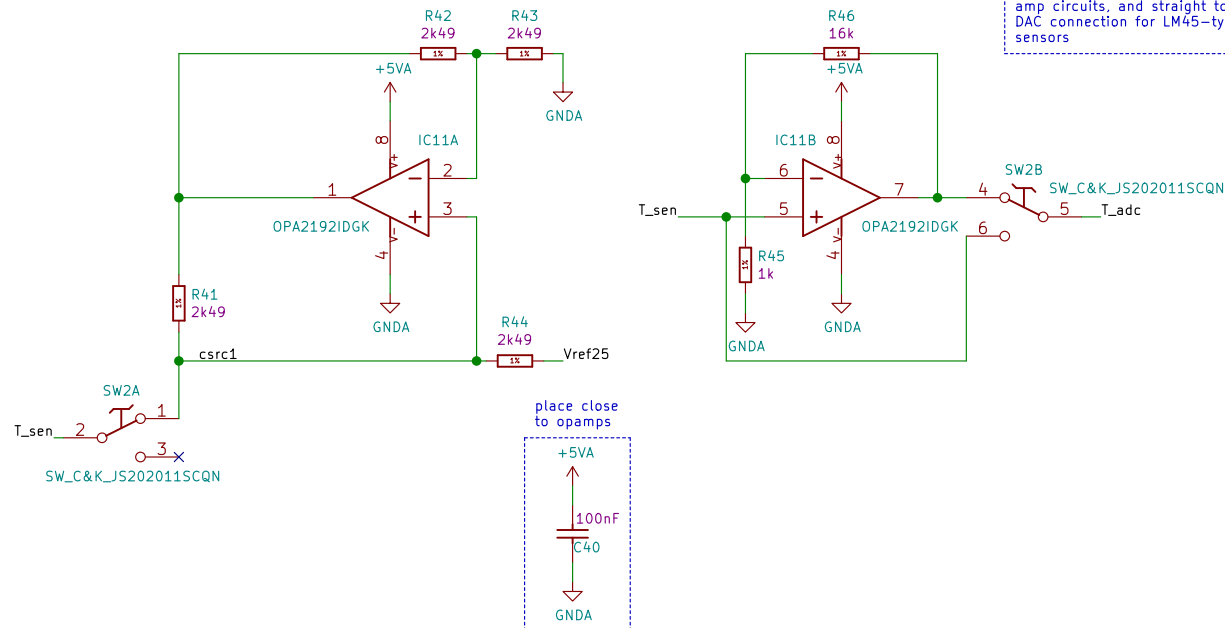
KiCad E.D.A. kicad 5.1.5

Rev: 0.2p

Id: 12/14

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T_adc  T_adc
 T_sen  T_sen
 Vref25  Vref25



Last modification: C. Gentsos (11.03.2020)

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

Title:

Size: A4

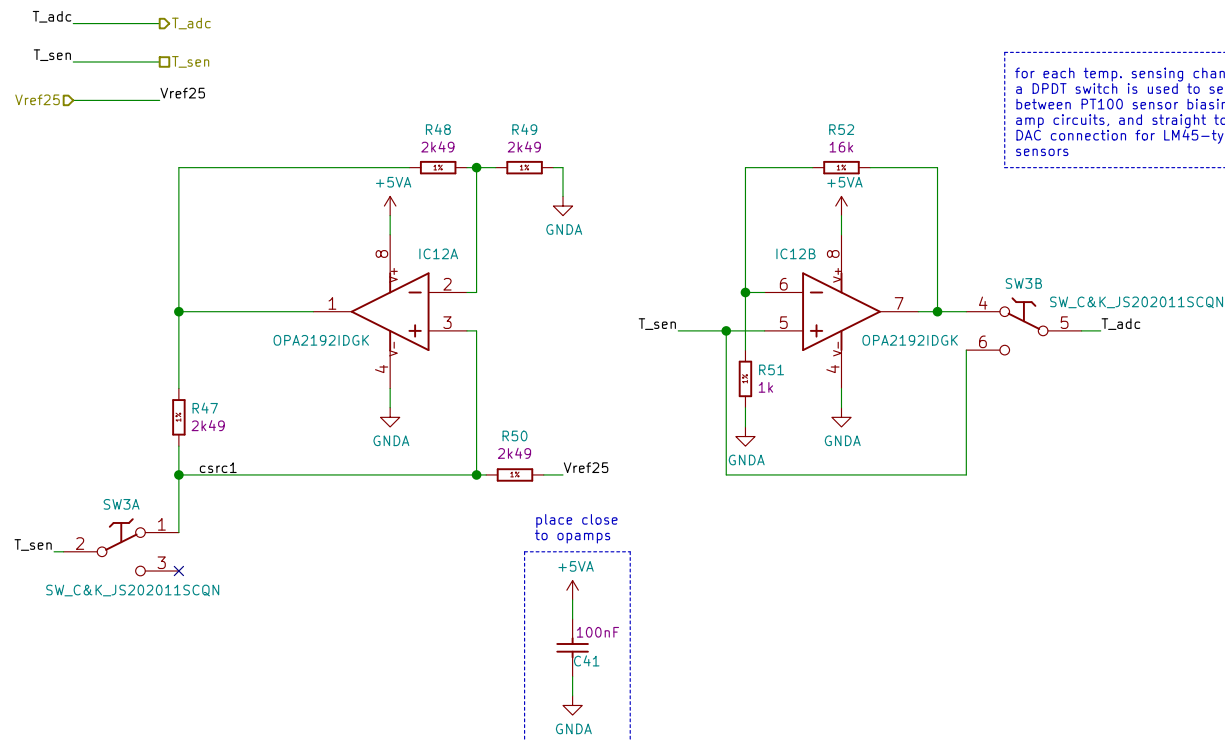
Date:

KiCad E.D.A. kicad 5.1.5

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 5.1.5

Rev: 0.2p

Id: 14/14