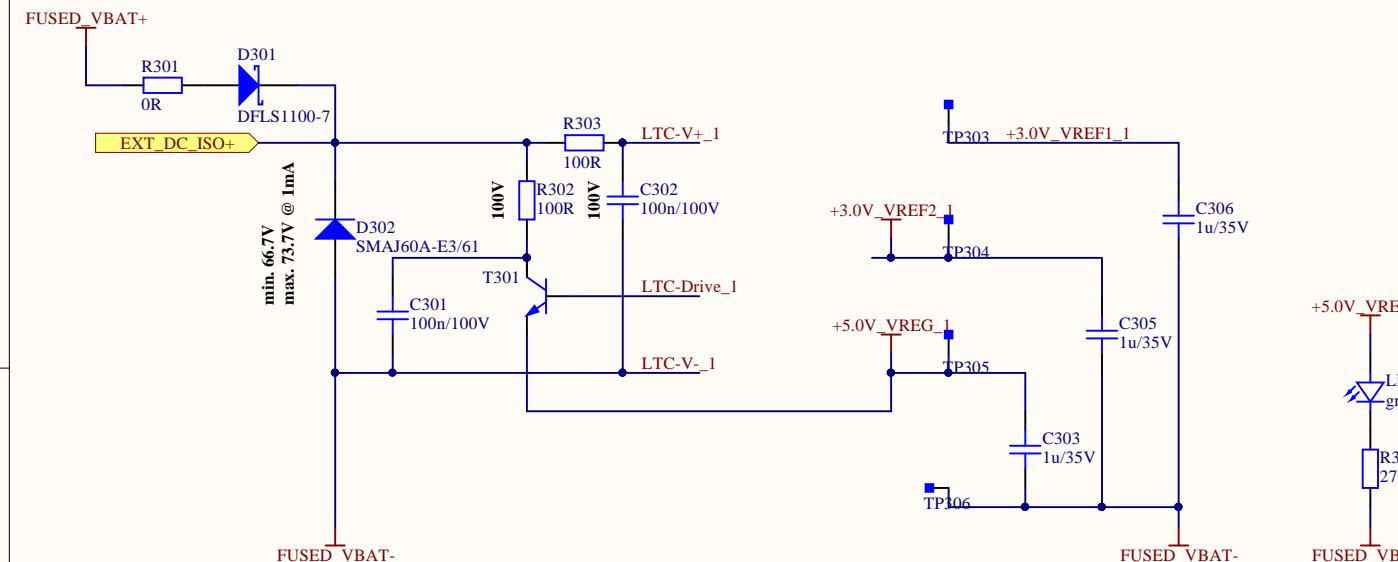
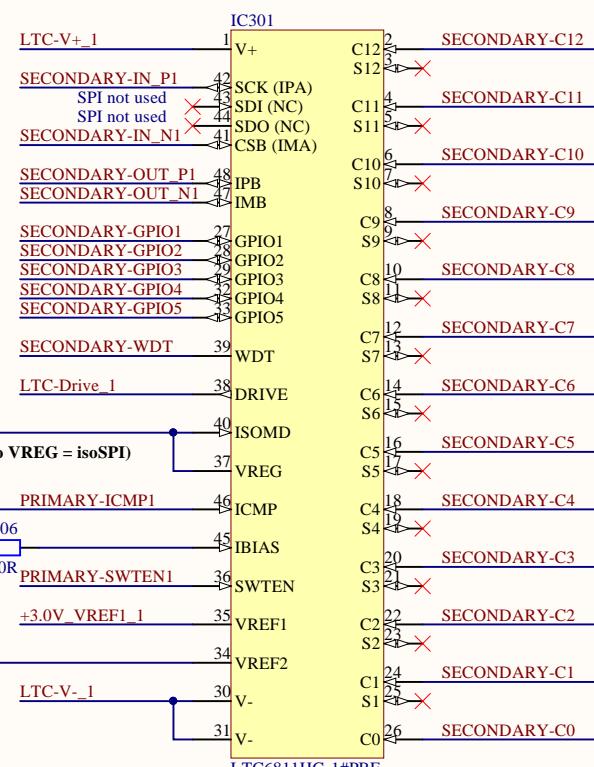


Power Supply

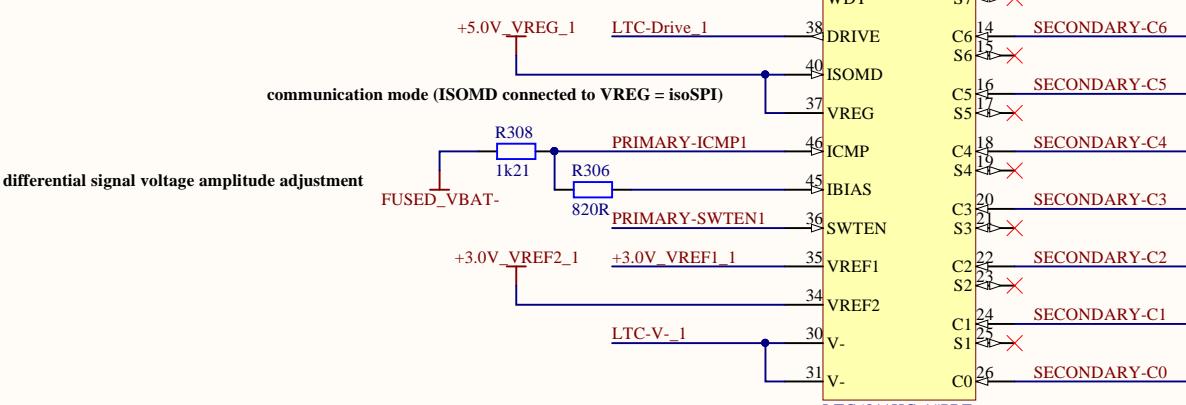


Cell voltage sense inputs

SECONDARY-C[0..12] <--> SECONDARY-C[0..18]



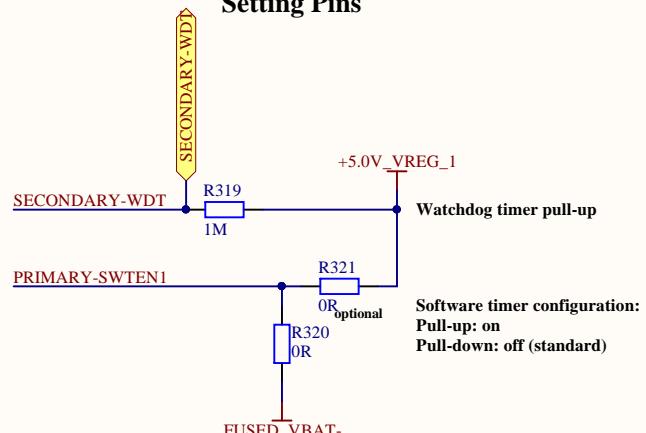
Cell balancing control

Cell balancing control
(not used on secondary)

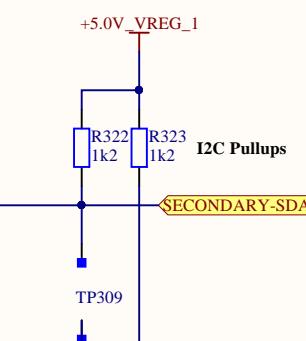
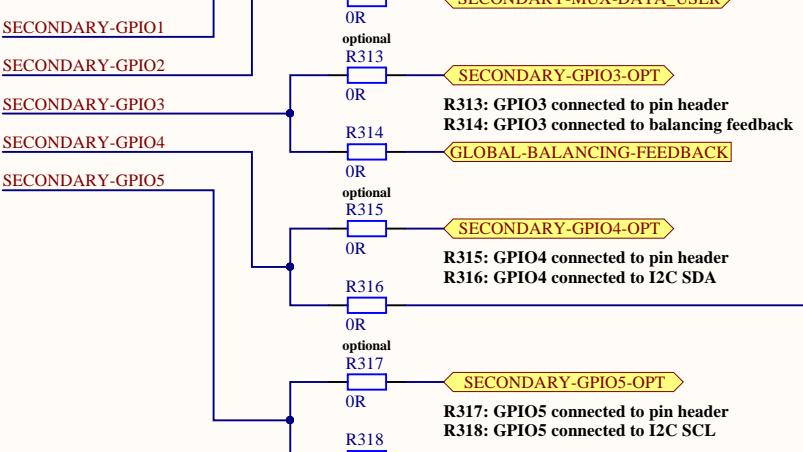
Layout:

- The transformer should be placed as close to the isoSPI cable connector as possible. The distance should be kept less than 2cm.
- The LTC6811 should be placed at least 1cm to 2cm away from the transformer.
- On the top component layer, no ground plane should be placed under the transformer, the isoSPI connector, or in between the transformer and the connector.
- The isoSPI signal traces should be isolated from surrounding circuits and traces by ground metal or space. No traces should cross the isoSPI signal lines, unless separated by a ground plane on an inner layer.

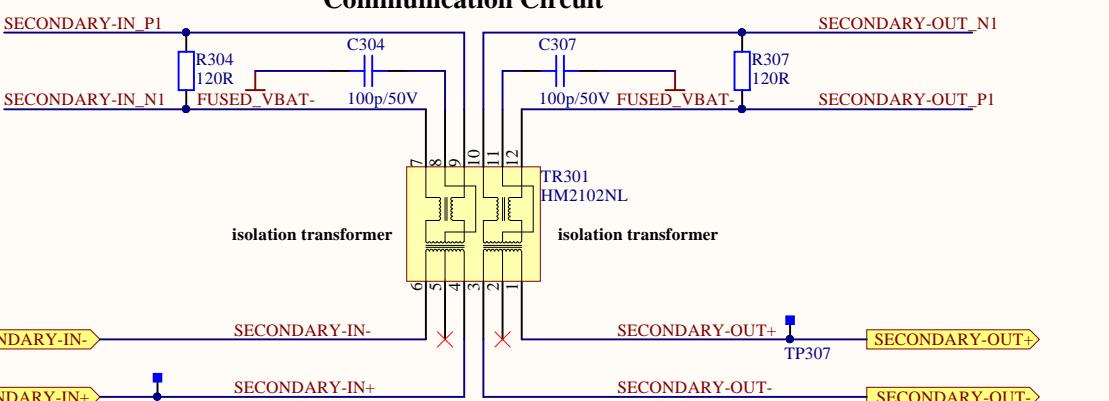
Setting Pins

Software timer configuration:
Pull-up: on
Pull-down: off (standard)LED on: LTC in STANDBY, REFUP or MEASURE mode
LED off: LTC in SLEEP mode

GPIO Pins

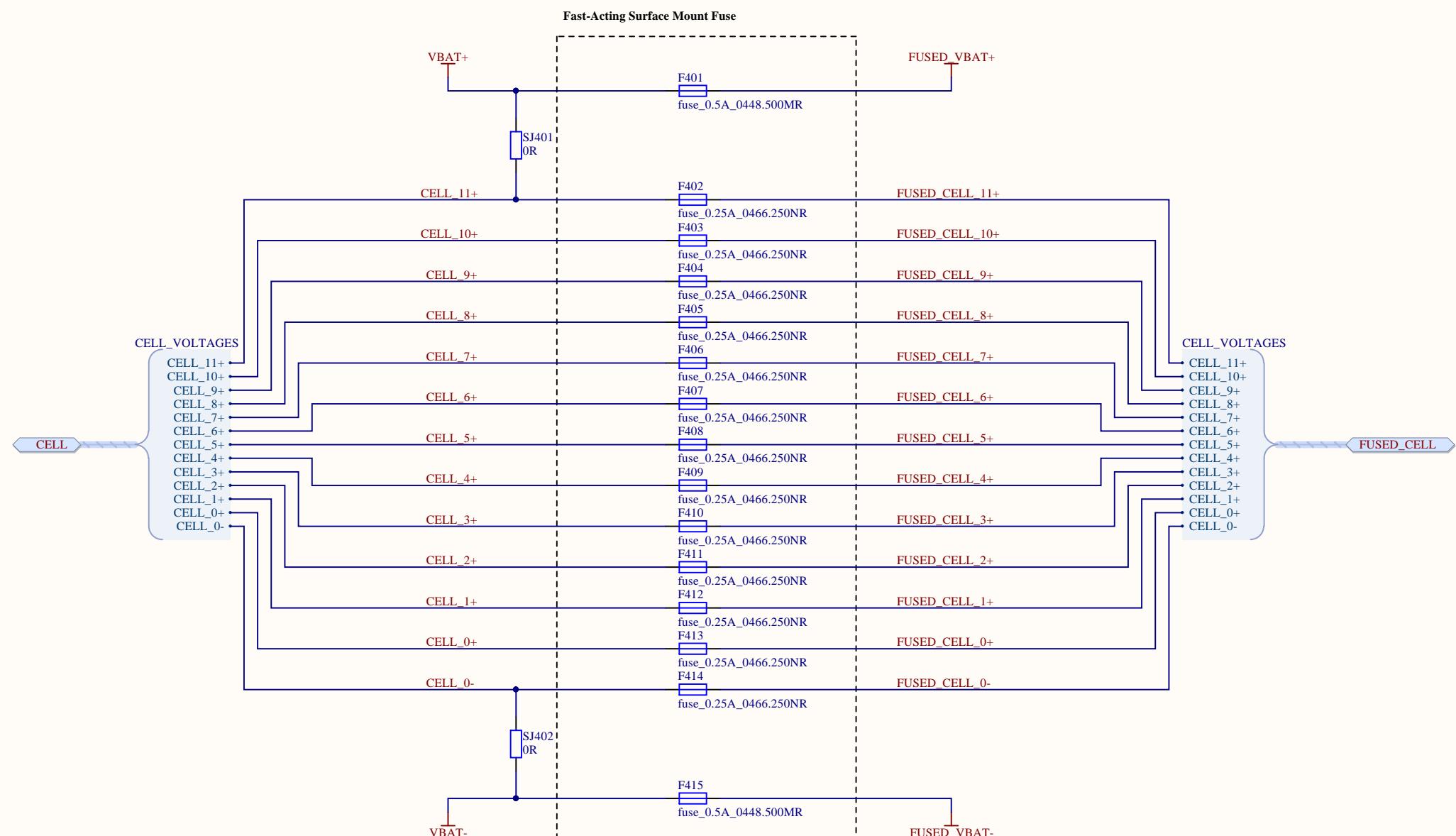


Communication Circuit

previous LTC6804/LTC6811
in daisy-chain

TP301

next LTC6804/LTC6811
in daisy-chain

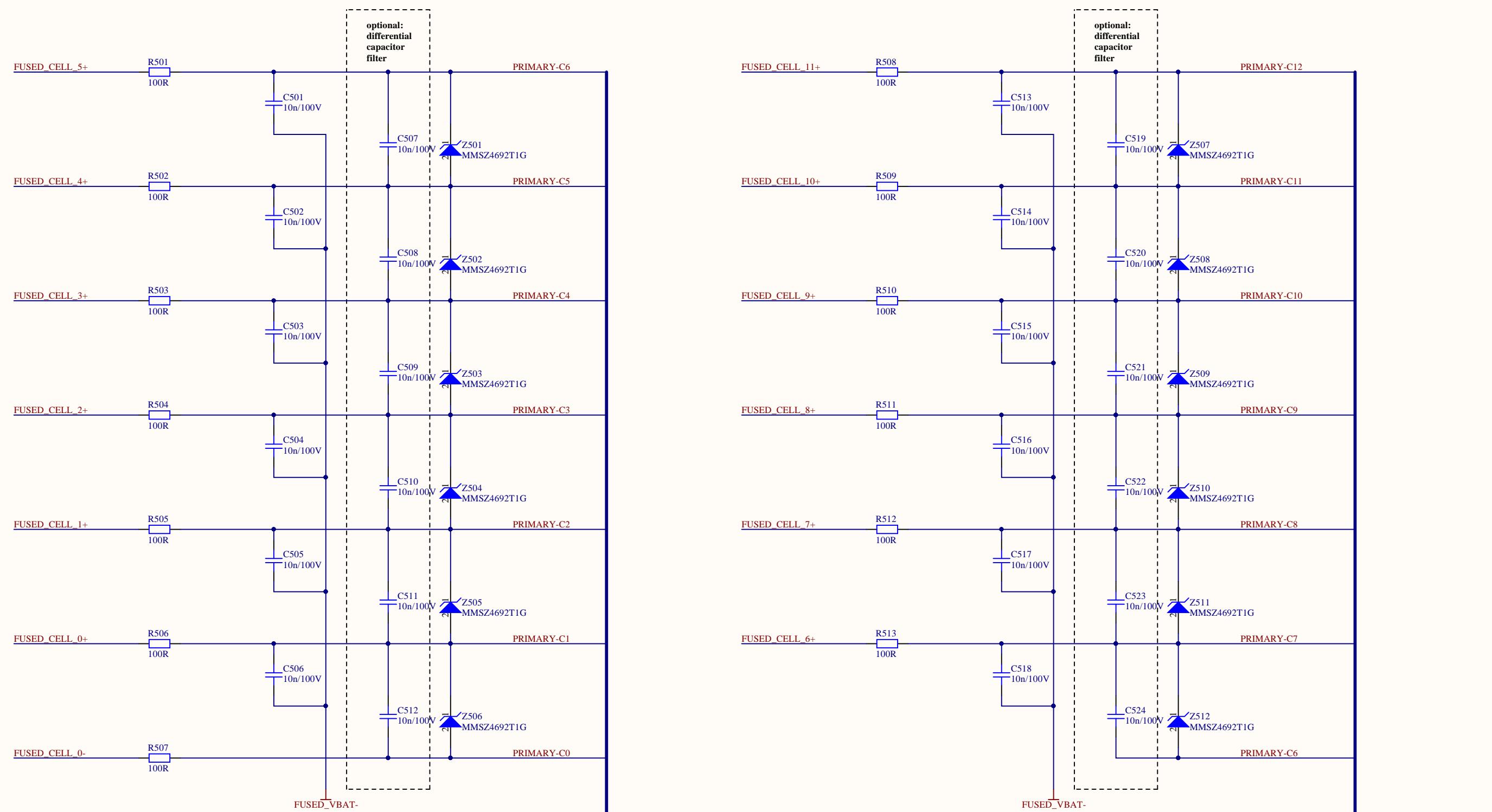


For Cell Balancing/Measuring Inputs: Max. 0.250A Balancing Current

Reaction Time:
200% Load (0.500A) = ca. 20ms
300% Load (0.750A) = <10ms

For Power Supply Inputs: Max. 0.500A Current

Reaction Time:
200% Load (1.000A) = ca. 200ms
300% Load (1.500A) = ca. 70ms



-3dB corner frequency of LTC6811 internal digital low-pass filter:

fast mode: 27kHz

normal mode: 6.8kHz

filtered mode: 26Hz

Grounded capacitor low-pass filter:

$C = 100nF \rightarrow f_g = 16kHz$

$C = 22nF \rightarrow f_g = 72kHz$

$C = 10nF \rightarrow f_g = 160kHz$ (recommended)

Differential capacitor low-pass filter (lower cost):

$C = 100nF \rightarrow f_g = 11kHz$

$C = 22nF \rightarrow f_g = 50kHz$

$C = 10nF \rightarrow f_g = 112kHz$

CELL_VOLTAGES

CELL_11+	FUSED_CELL_11+
CELL_10+	FUSED_CELL_10+
CELL_9+	FUSED_CELL_9+
CELL_8+	FUSED_CELL_8+
CELL_7+	FUSED_CELL_7+
CELL_6+	FUSED_CELL_6+
CELL_5+	FUSED_CELL_5+
CELL_4+	FUSED_CELL_4+
CELL_3+	FUSED_CELL_3+
CELL_2+	FUSED_CELL_2+
CELL_1+	FUSED_CELL_1+
CELL_0+	FUSED_CELL_0+
CELL_0-	FUSED_CELL_0-



www.foxbms.org

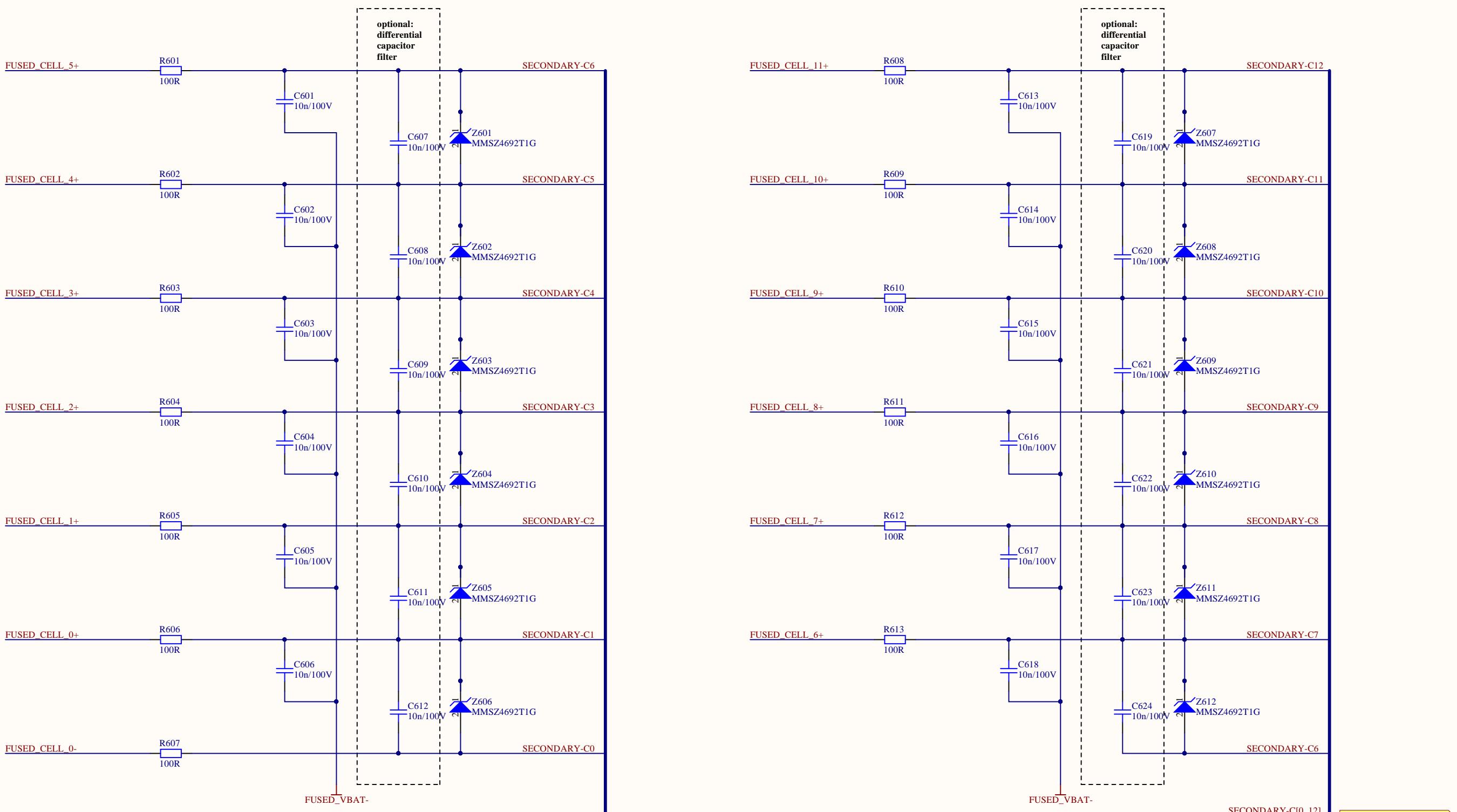
developed by:
Fraunhofer IISB
Schottkystr. 10
91058 Erlangen
Germany

Fraunhofer
IISB
www.iisb.fraunhofer.de

Project
BMS-Slave 12-Cell
Author
foxBMS Team

Description
Primary Voltage Measurement
License
Creative Commons Attribution 4.0

File
primary_decoupling.SchDoc
Version
2.1.5
Release Date
2018-08-08
Sheet
5 / 19

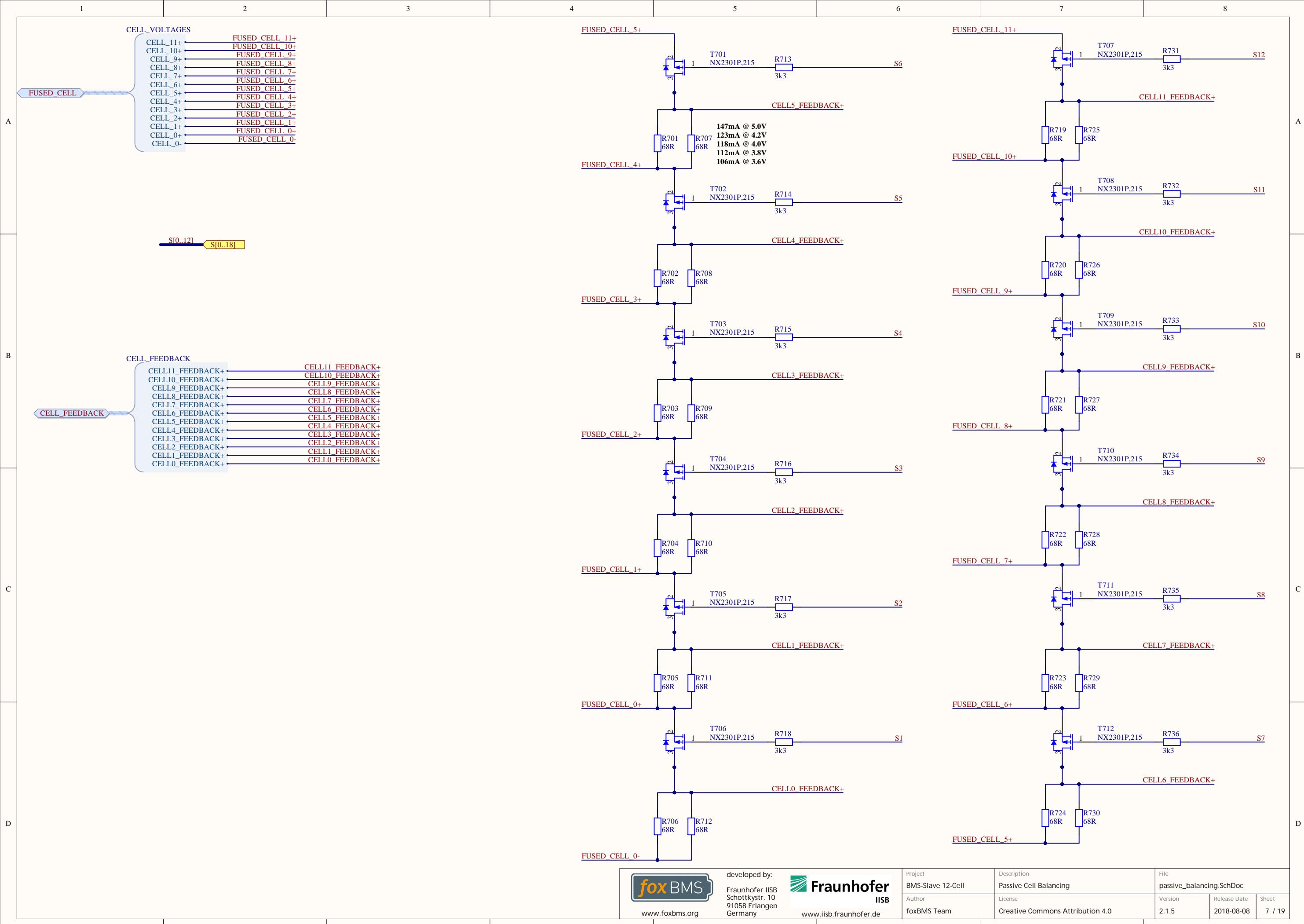


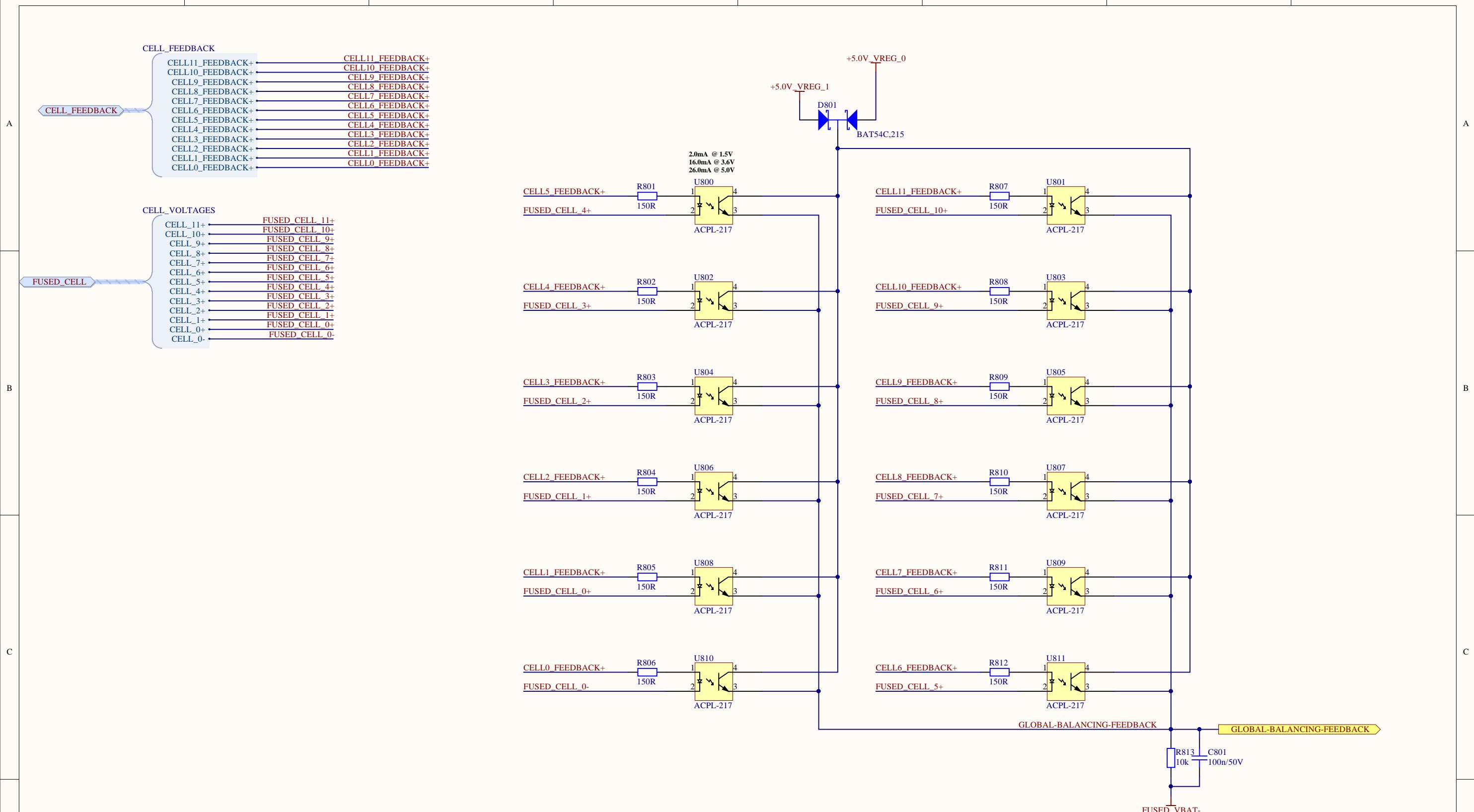
-3dB corner frequency of LTC6811 internal digital low-pass filter:
fast mode: 27kHz
normal mode: 6.8kHz
filtered mode: 26Hz

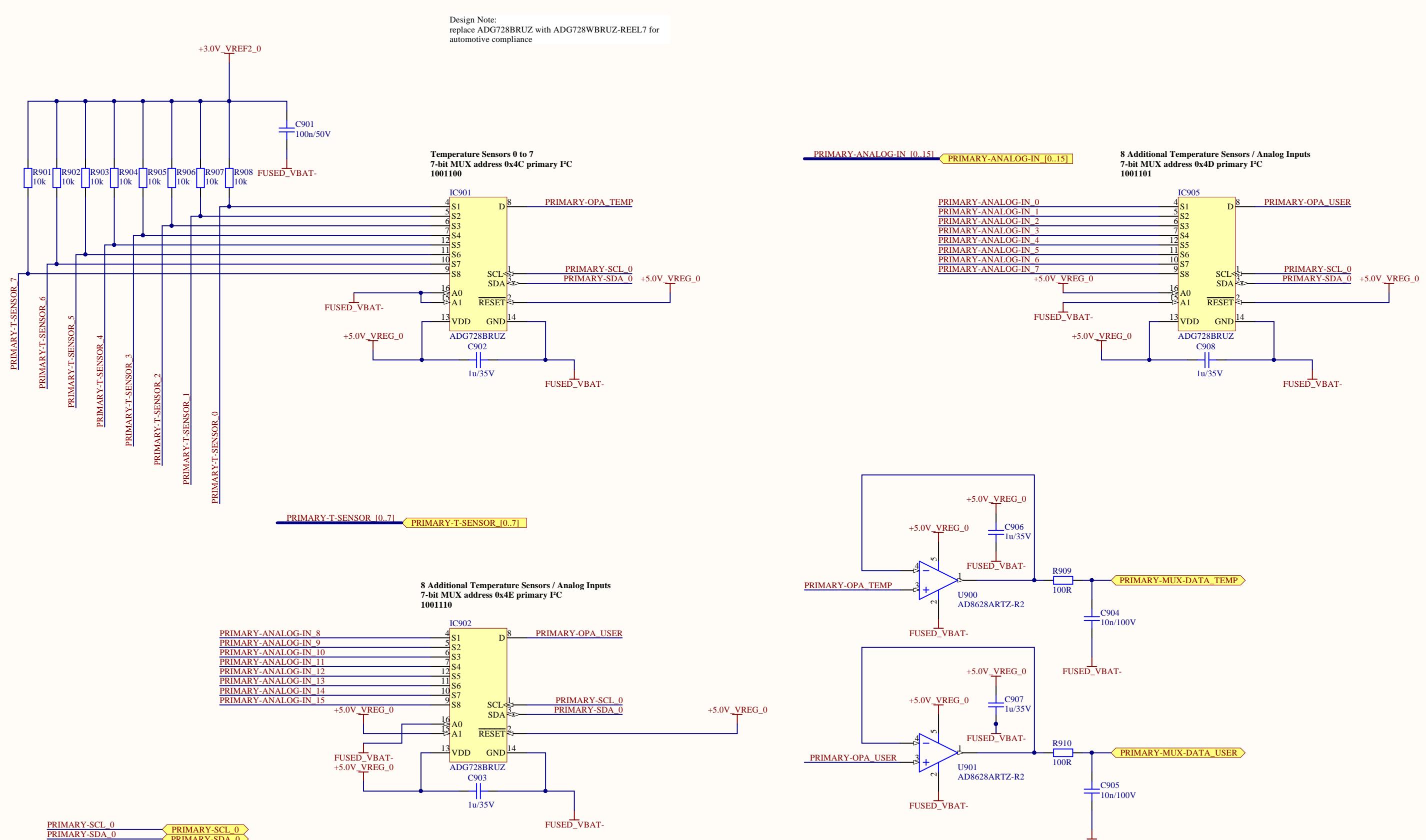
Grounded capacitor low-pass filter:
 $C = 100\text{nF} \rightarrow f_g = 16\text{kHz}$
 $C = 22\text{nF} \rightarrow f_g = 72\text{kHz}$
 $C = 10\text{nF} \rightarrow f_g = 160\text{kHz}$ (recommended)

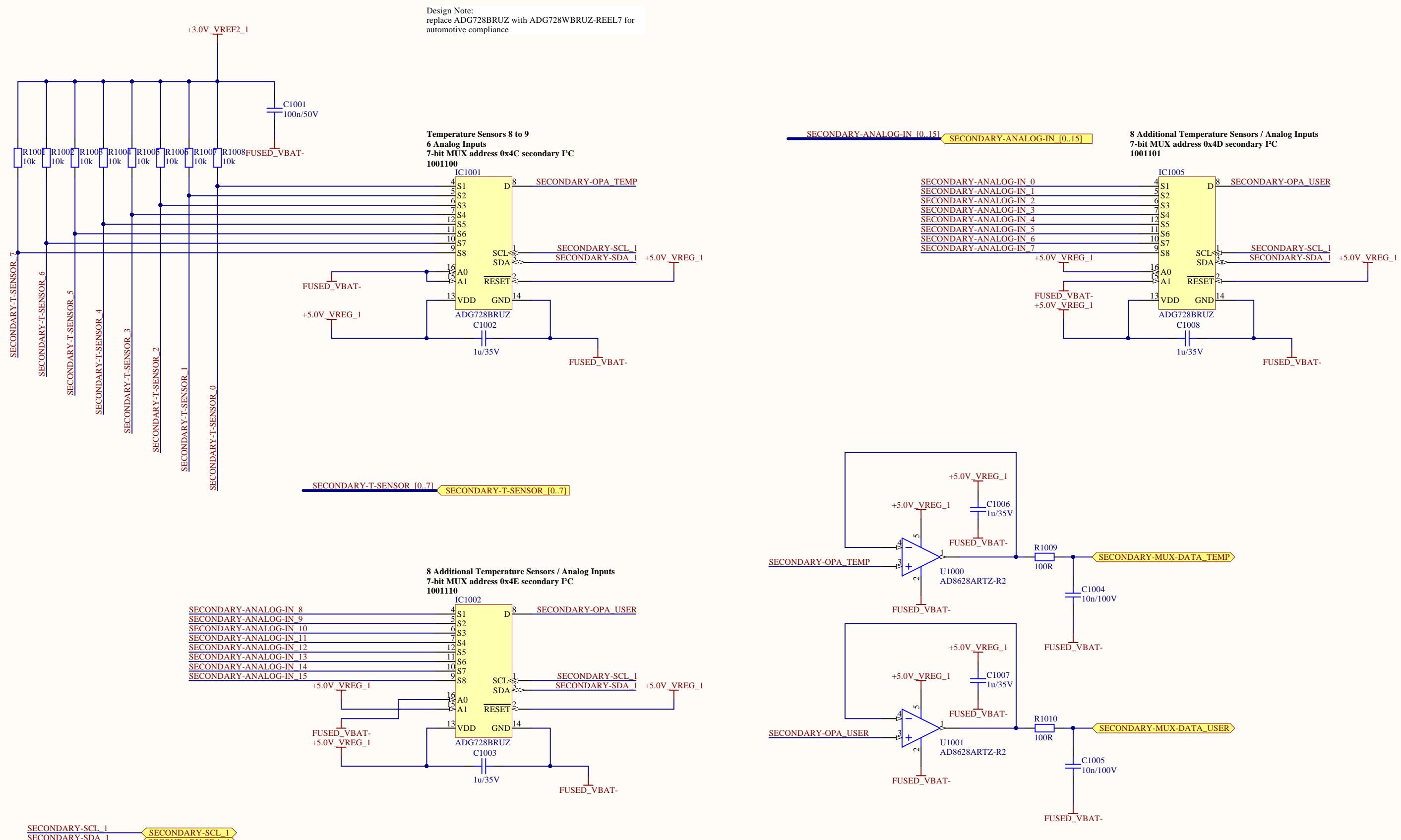
Differential capacitor low-pass filter (lower cost):
 $C = 100\text{nF} \rightarrow f_g = 11\text{kHz}$
 $C = 22\text{nF} \rightarrow f_g = 50\text{kHz}$
 $C = 10\text{nF} \rightarrow f_g = 112\text{kHz}$

CELL_VOLTAGES	
CELL_11+	FUSED_CELL_11+
CELL_10+	FUSED_CELL_10+
CELL_9+	FUSED_CELL_9+
CELL_8+	FUSED_CELL_8+
CELL_7+	FUSED_CELL_7+
CELL_6+	FUSED_CELL_6+
CELL_5+	FUSED_CELL_5+
CELL_4+	FUSED_CELL_4+
CELL_3+	FUSED_CELL_3+
CELL_2+	FUSED_CELL_2+
CELL_1+	FUSED_CELL_1+
CELL_0+	FUSED_CELL_0+
CELL_0-	FUSED_CELL_0-









A

A

B

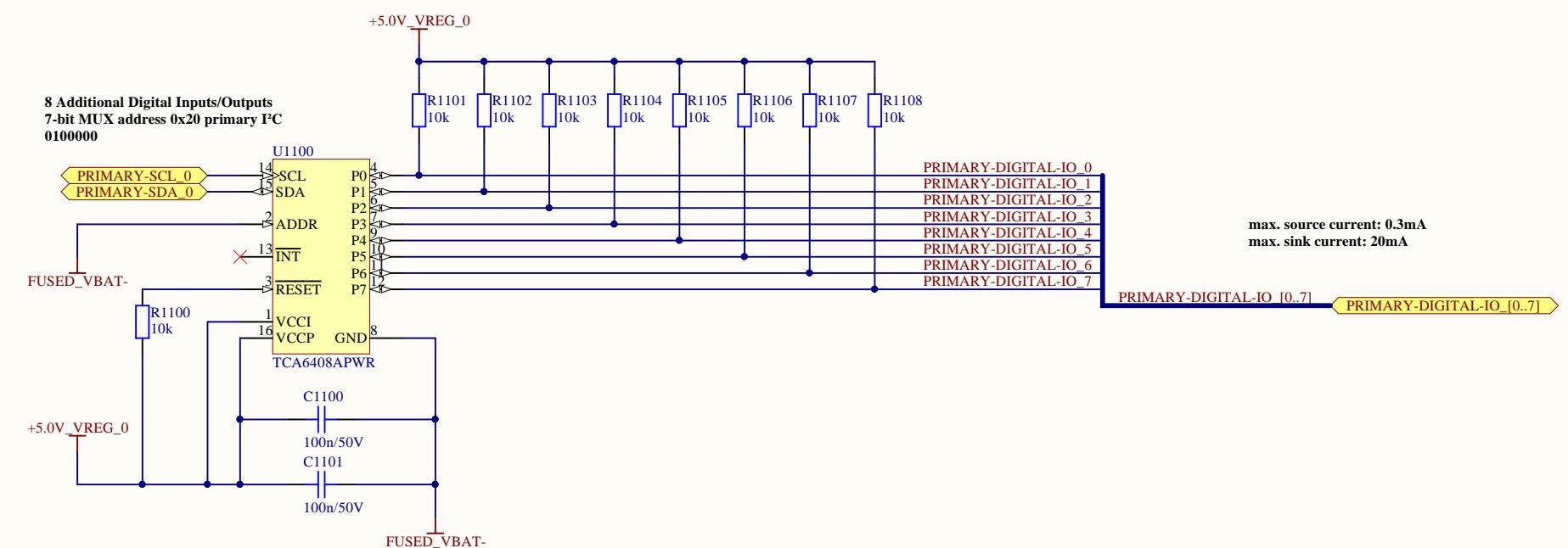
B

C

C

D

D



A

A

B

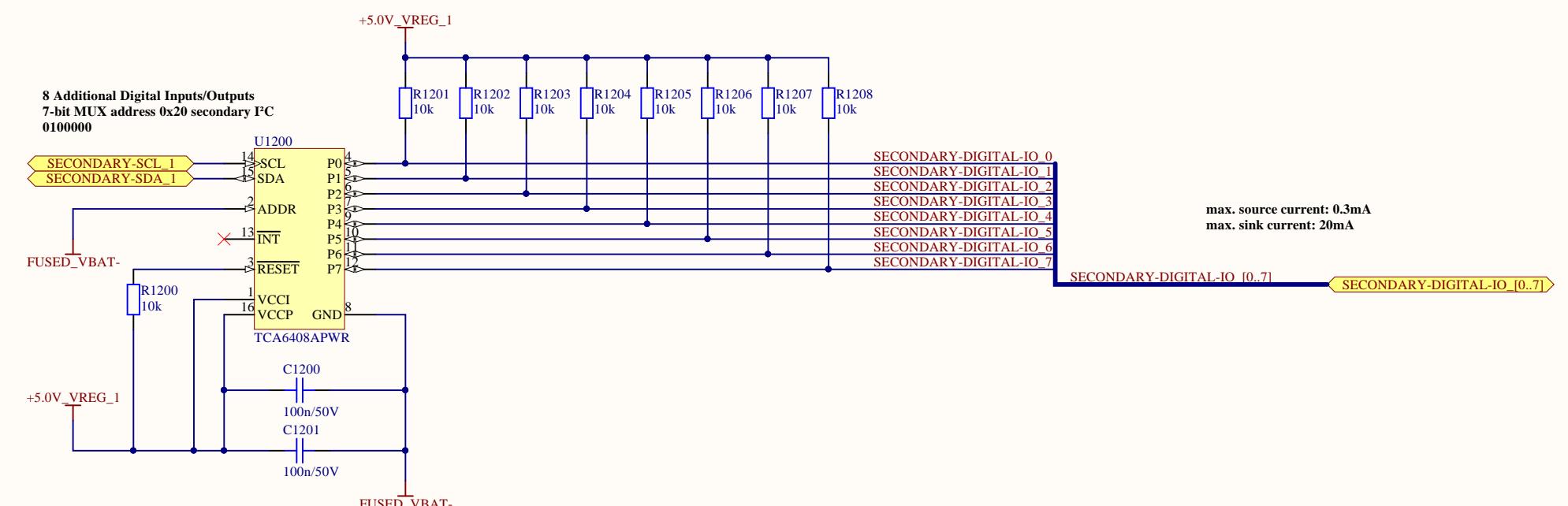
B

C

C

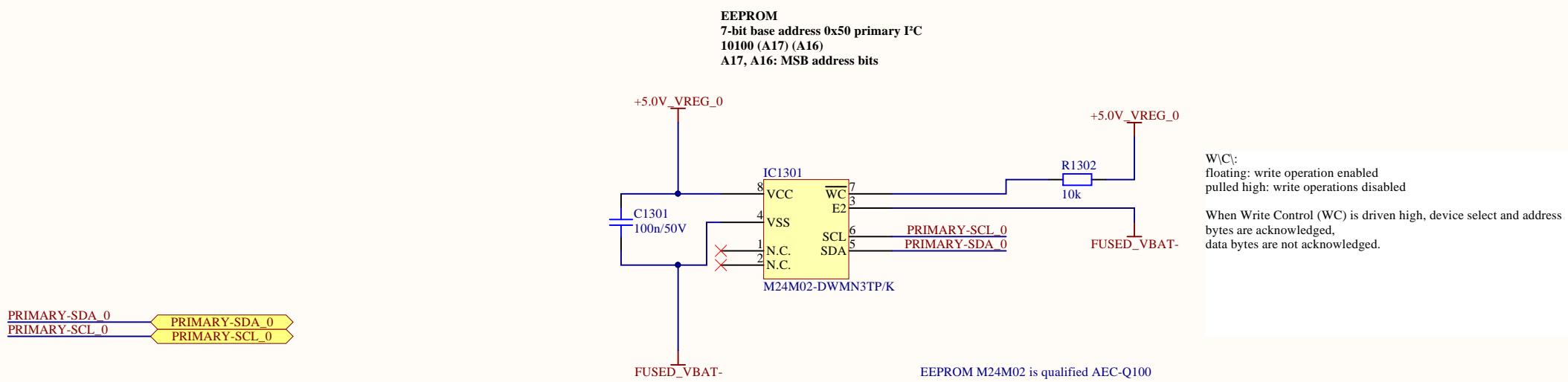
D

D



A

A



B

B



C

C

A

A

B

B

C

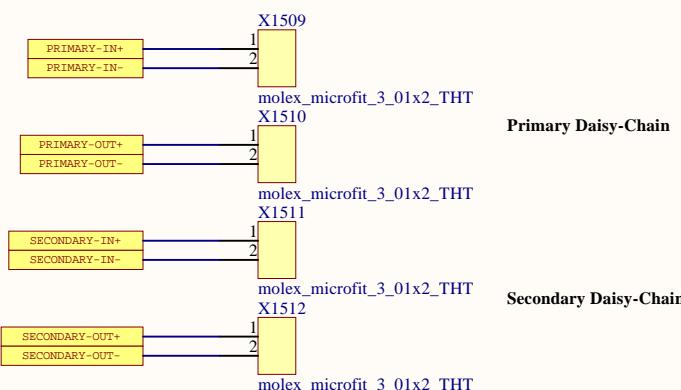
C

D

D

Daisy Chain Connectors

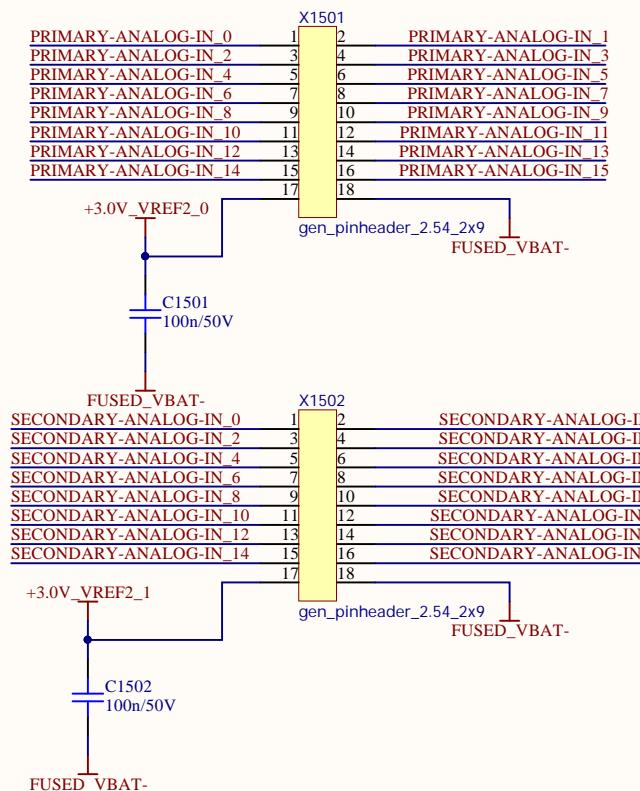
4x 2p connector equal for 12/15/18/20 cell version



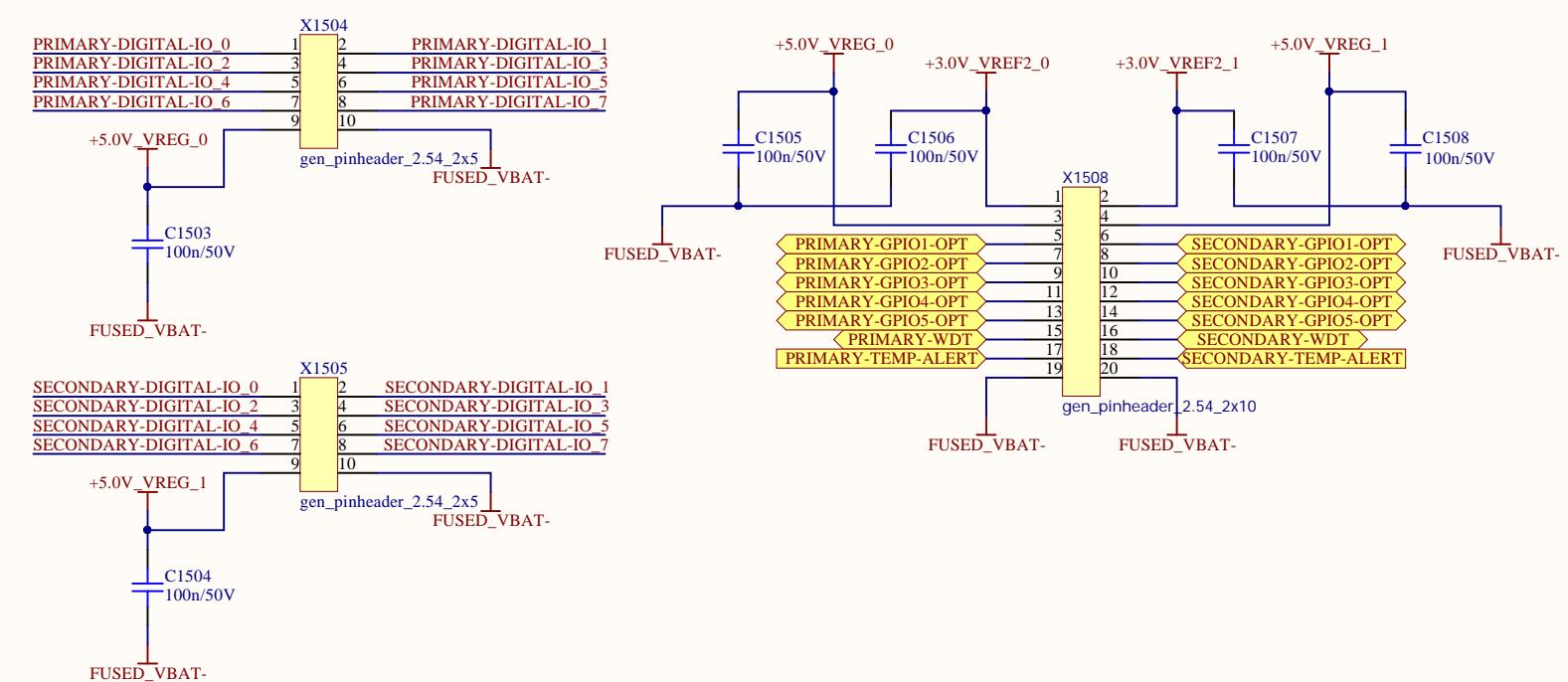
A

A

Pin-Header for additional analog and digital inputs/outputs

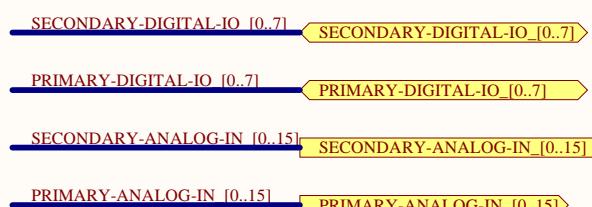


GPIO Extension Connector



B

B



C

C

D

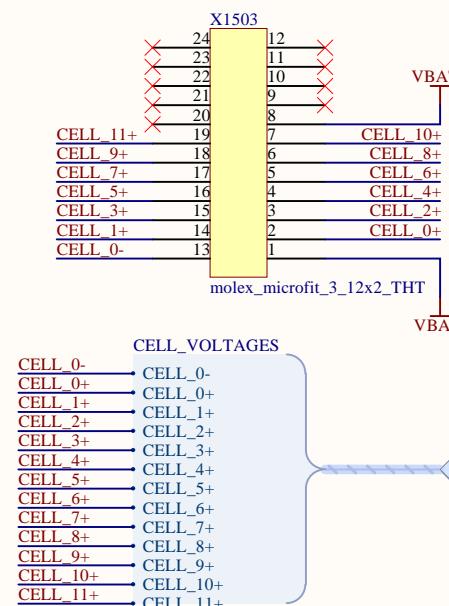
D

A

A

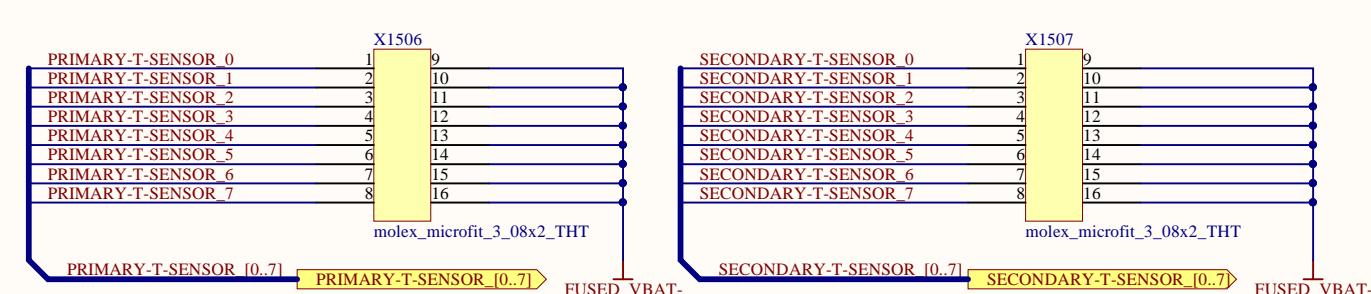
Batterie Cell Voltage Sense Connector

24p connector equal for 12/15/18/20 cell version



Temperature Sensor Connector

2x 16p connector equal for 12/15/18/20 cell version



B

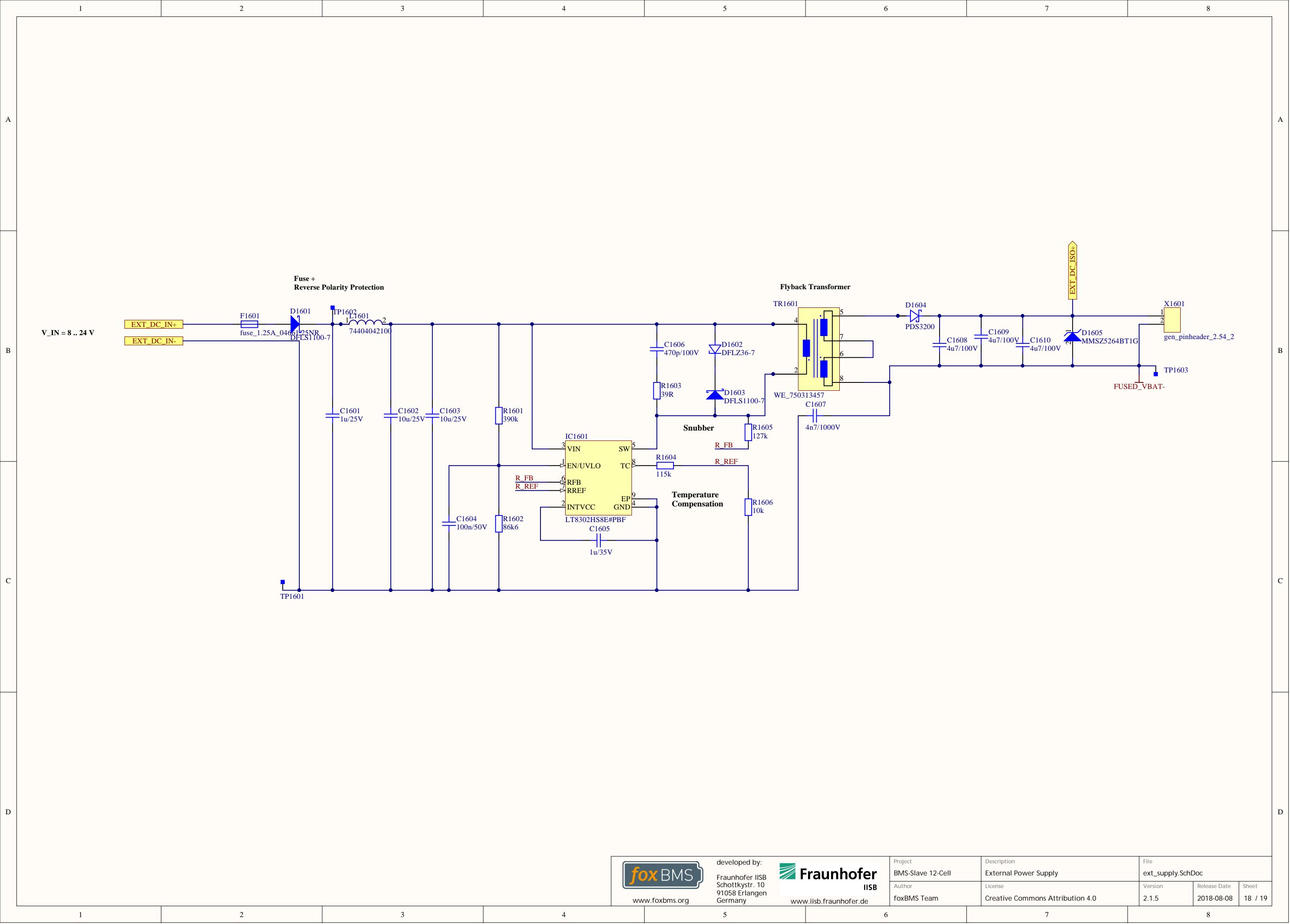
B

C

C

D

D



A

A

B

B

C

C

D

D

External Power Supply

