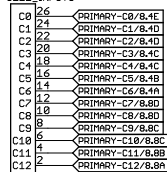


Cell voltage sense inputs

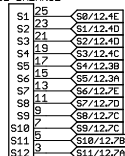
IC201-CELL_INPUTS



LTC6804HG-1#PBF

Cell balancing control

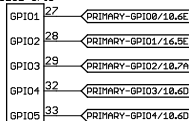
IC201-BALANCE



LTC6804HG-1#PBF

LTC6804 GPIO

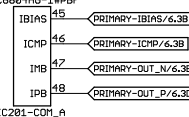
IC201-GPIO



LTC6804HG-1#PBF

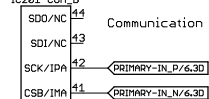
Communication input/output and configuration

LTC6804HG-1#PBF



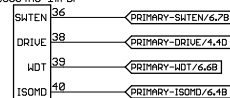
IC201-COM_A

IC201-COM_B



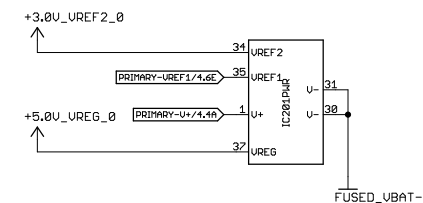
LTC6804HG-1#PBF


LTC6804HG-1#PBF



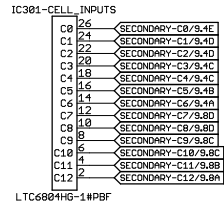
IC201-CONTROL

Internal voltage reference

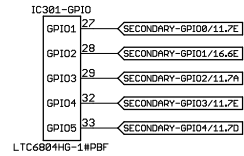


| | | |
|---|----------------|-------------|
| TITLE: foxBMS BMS-Slave | | |
| DESCRIPTION: Primary LTC6804 | | |
| FILENAME: foxBMS_BMS-Slave | | |
| AUTHOR: Fraunhofer IISB foxBMS Team | | |
| LICENSE: Creative Commons Attribution 4.0  | | |
| DATE: 2017-05-09 | VERSION: 1.0.1 | SHEET: 2/18 |

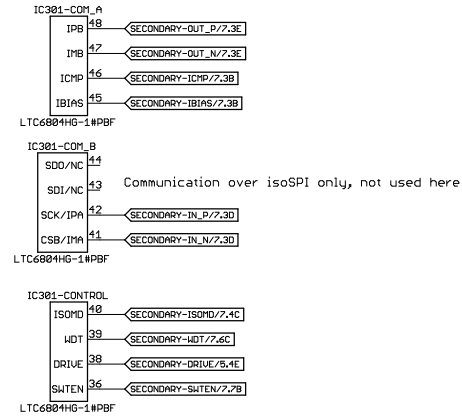
Cell voltage sense inputs



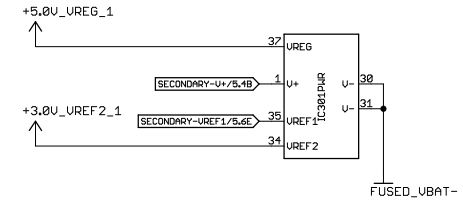
LTC6804 GPIO



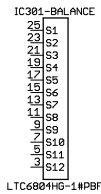
Communication input/output and configuration




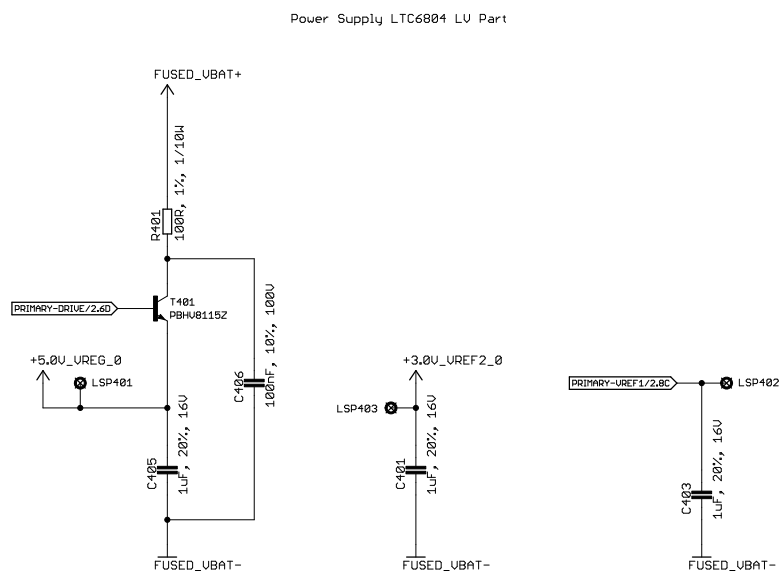
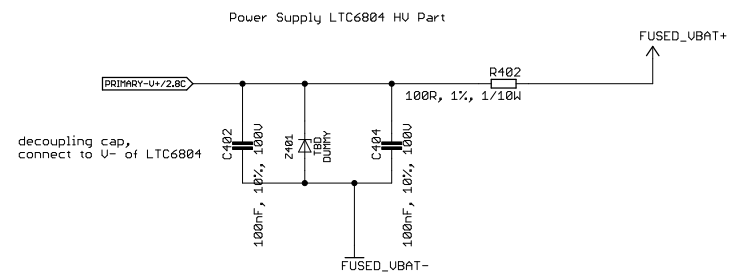
Internal voltage reference




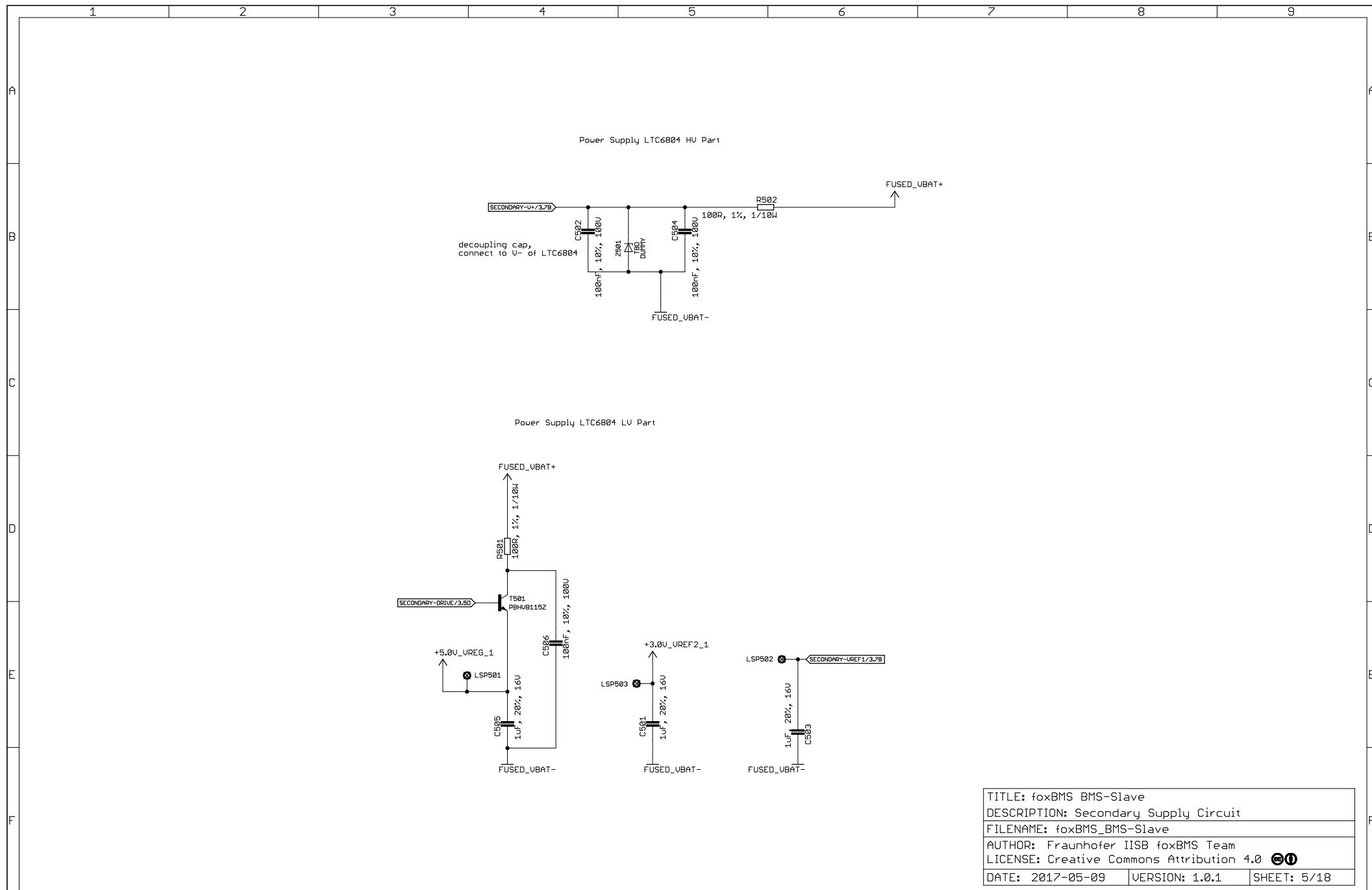
Cell balancing control
(not used on secondary LTC6804)



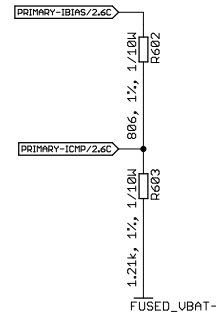
| | | |
|---|----------------|-------------|
| TITLE: foxBMS BMS-Slave | | |
| DESCRIPTION: Secondary LTC6804 | | |
| FILENAME: foxBMS_BMS-Slave | | |
| AUTHOR: Fraunhofer IISB foxBMS Team | | |
| LICENSE: Creative Commons Attribution 4.0  | | |
| DATE: 2017-05-09 | VERSION: 1.0.1 | SHEET: 3/18 |



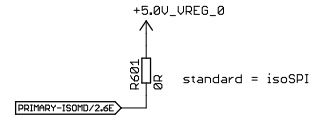
| | | |
|---|----------------|-------------|
| TITLE: foxBMS BMS-Slave | | |
| DESCRIPTION: Primary Supply Circuit | | |
| FILENAME: foxBMS_BMS-Slave | | |
| AUTHOR: Fraunhofer IISB foxBMS Team | | |
| LICENSE: Creative Commons Attribution 4.0  | | |
| DATE: 2017-05-09 | VERSION: 1.0.1 | SHEET: 4/18 |



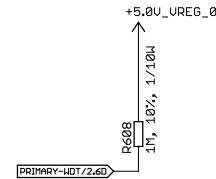
Adjustment of the amplitude
of the differential signal voltage



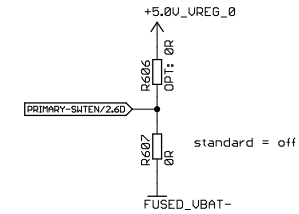
isoSPI mode or SPI mode configuration



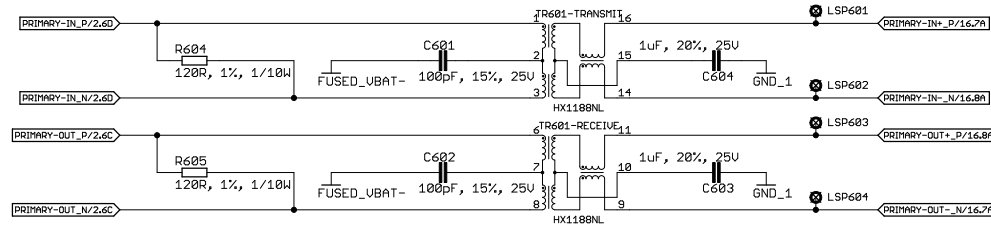
Watchdog timer configuration



Software timer configuration




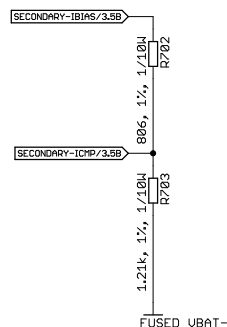
isoSPI isolation



Layout:

- The transformer should be placed as close to the isoSPI cable connector as possible.
The distance should be kept less than 2cm.
- The LTC6804 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.

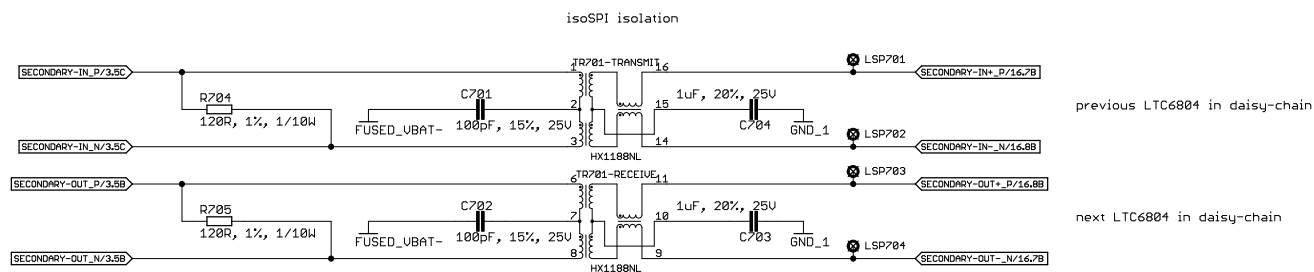
| | | |
|---|----------------|-------------|
| TITLE: foxBMS BMS-Slave | | |
| DESCRIPTION: Primary Communication Circuit | | |
| FILENAME: foxBMS_BMS-Slave | | |
| AUTHOR: Fraunhofer IISB foxBMS Team | | |
| LICENSE: Creative Commons Attribution 4.0  | | |
| DATE: 2017-05-09 | VERSION: 1.0.1 | SHEET: 6/18 |




standard = isoSPI

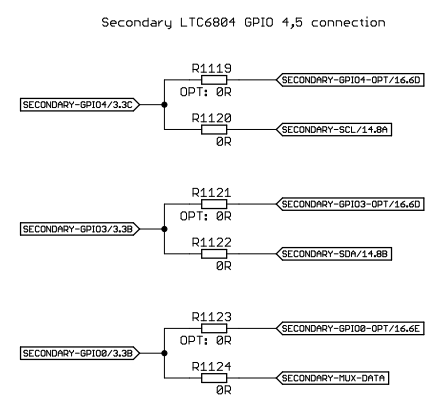
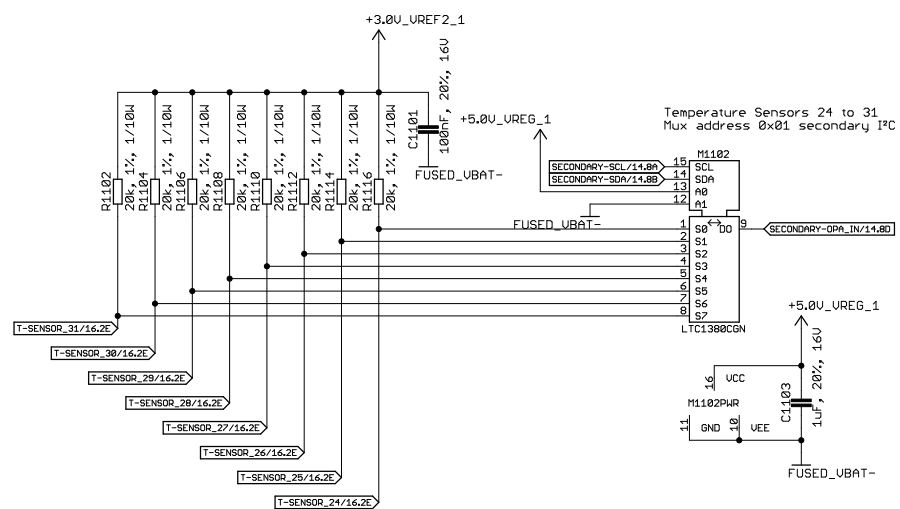
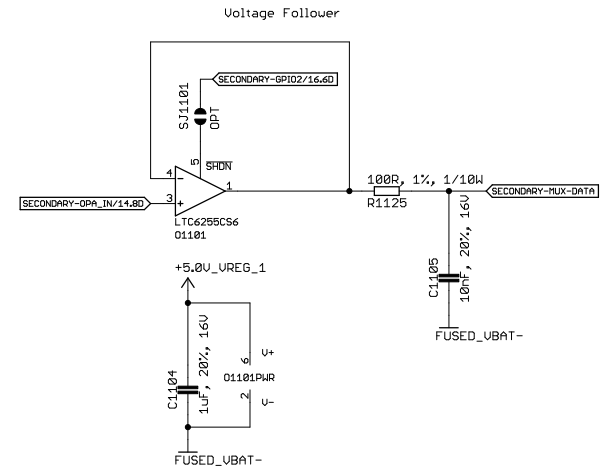
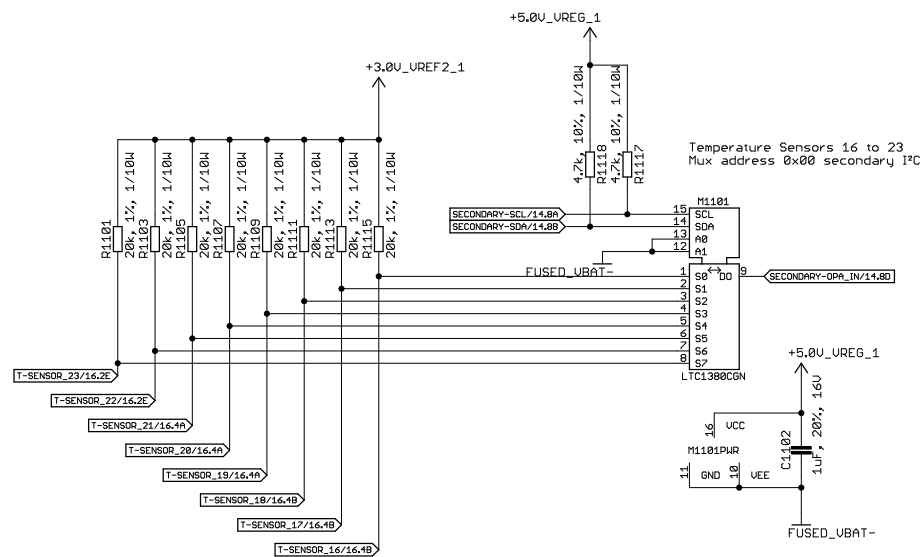
Diagram illustrating the secondary shutdown pin configuration:


- The pin is connected to $+5.00V_{UREG_1}$ via a pull-up resistor $R206$ (0Ω).
- The pin is connected to $FUSED_VBAT-$ via a resistor $R207$ (0Ω).
- A label **SECONDARY-SHTEN/3.5D** points to the pin.
- A note indicates **standard = off**.

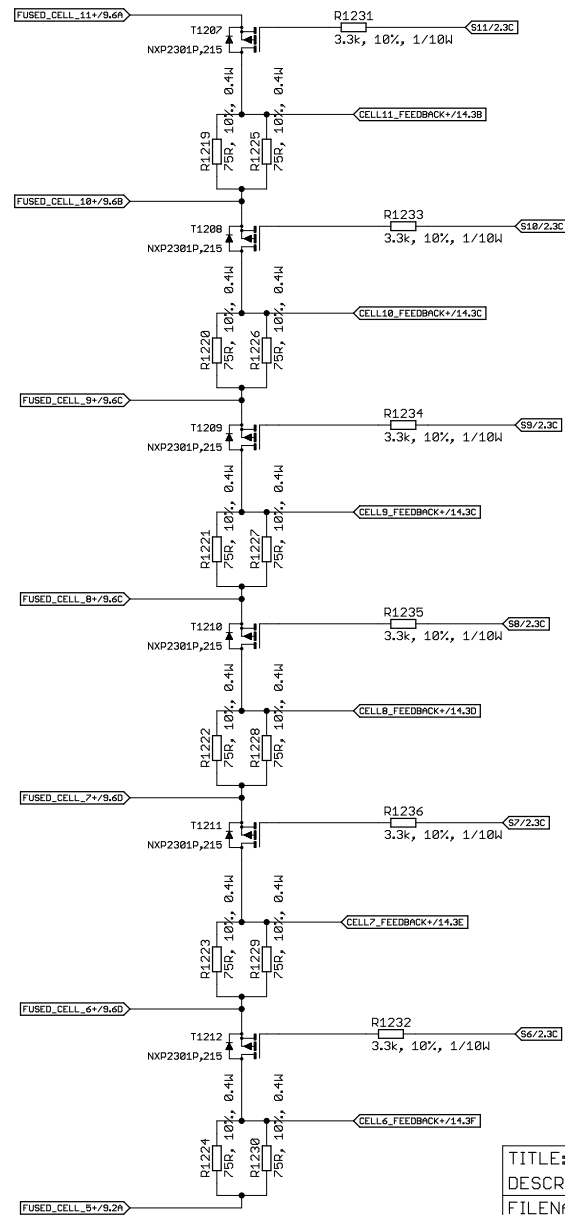
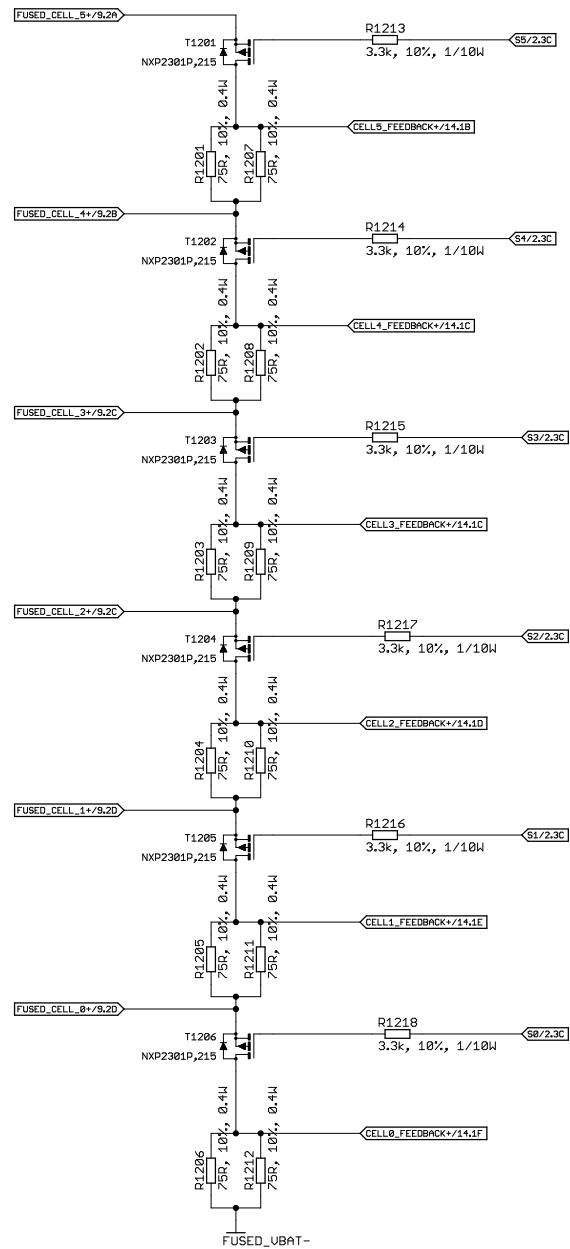



- The transformer should be placed as close to the isoSPI cable connector as possible.
The distance should be kept less than 2cm.
- The LTC6804 should be placed at least 1cm to 2cm away from the transformer.
- On the top component layer, no ground plane should be placed under the transformer, the isoSPI 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.

| | | |
|---|----------------|-------------|
| TITLE: foxBMS BMS-Slave | | |
| DESCRIPTION: Secondary Communication Circuit | | |
| FILENAME: foxBMS_BMS-Slave | | |
| AUTHOR: Fraunhofer IISB foxBMS Team | | |
| LICENSE: Creative Commons Attribution 4.0  | | |
| DATE: 2017-05-09 | VERSION: 1.0.1 | SHEET: 7/18 |

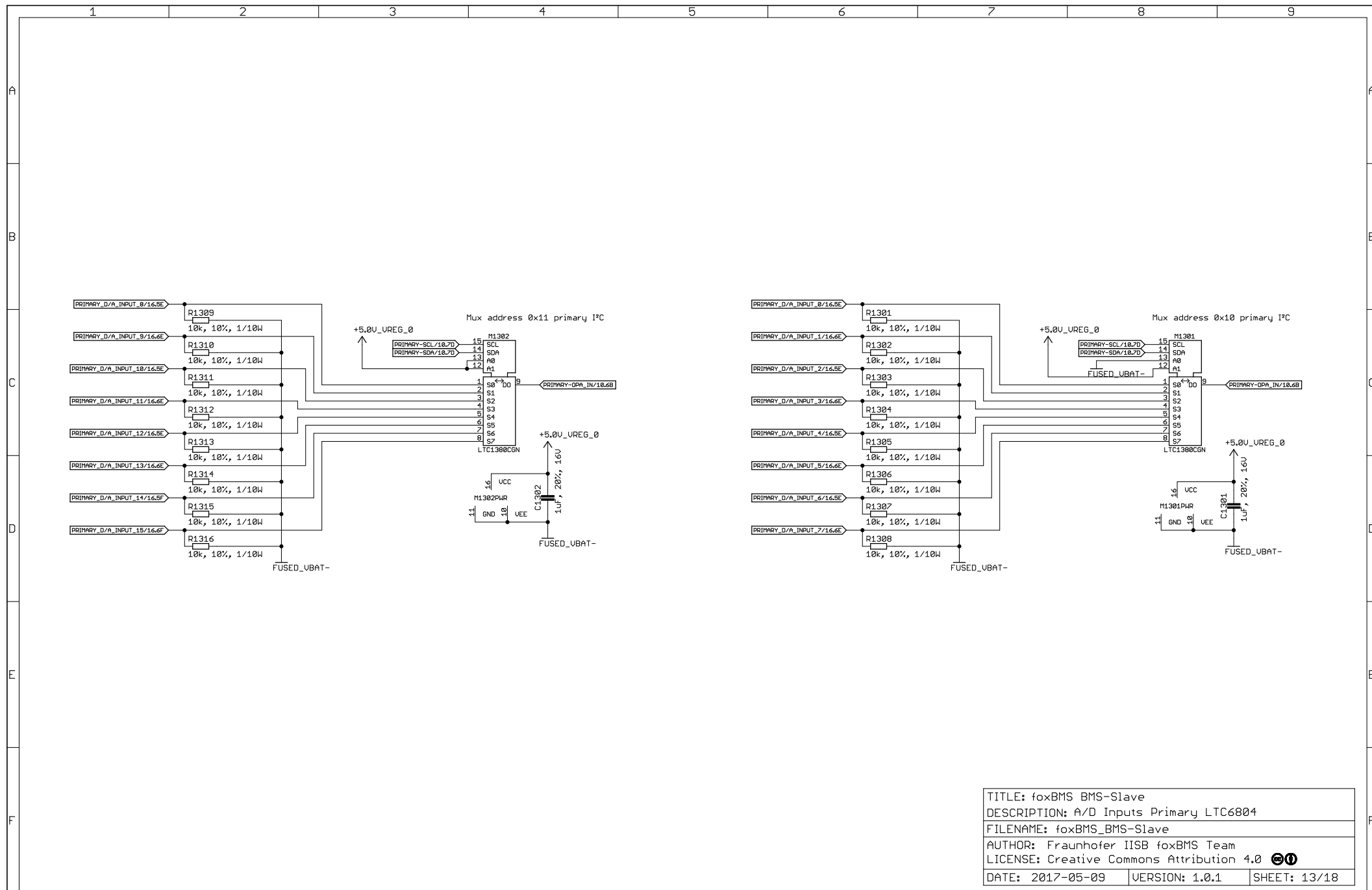


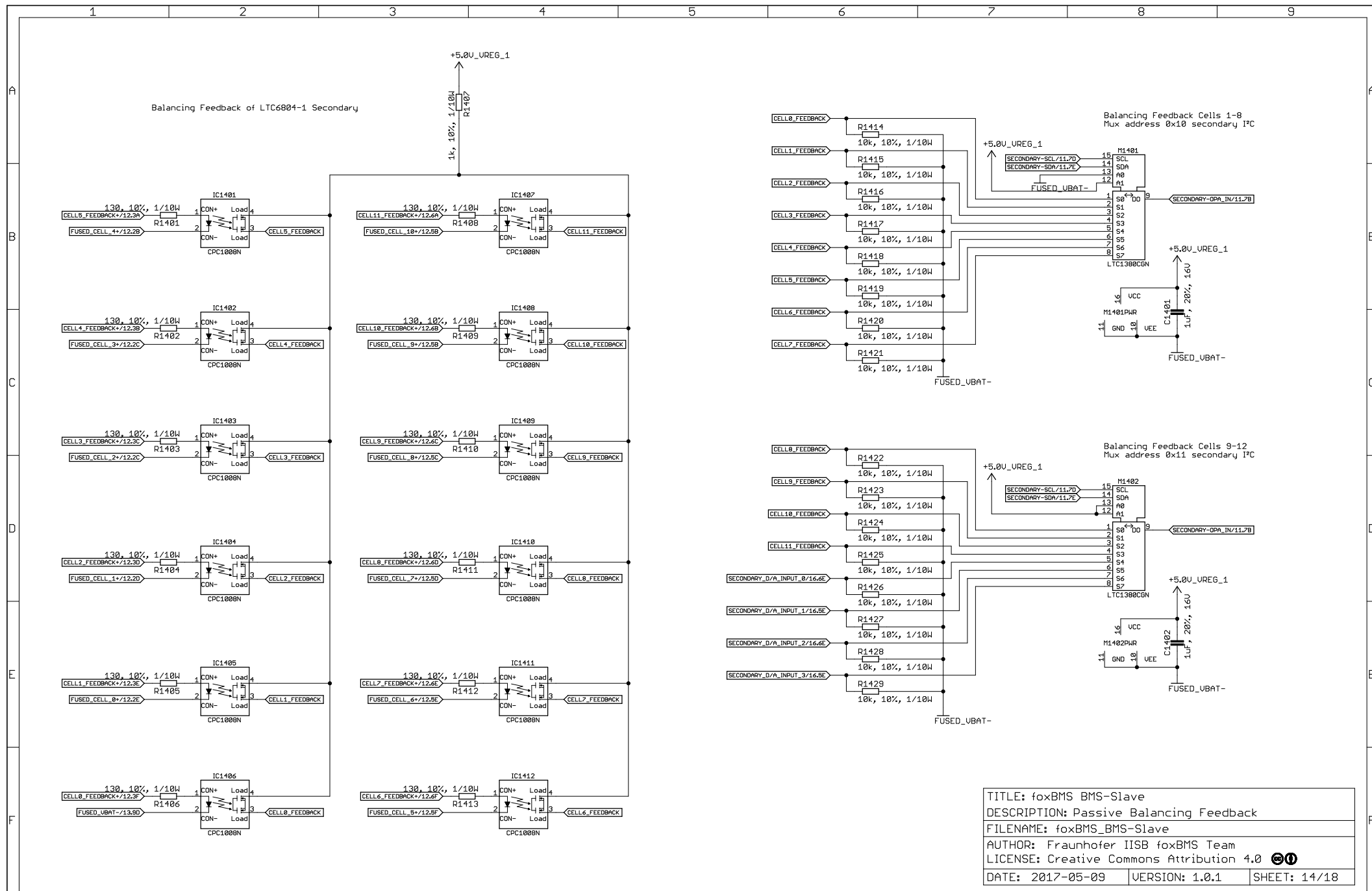
| | | |
|---|----------------|--------------|
| TITLE: foxBMS BMS-Slave | | |
| DESCRIPTION: Secondary Temperature Measurement | | |
| FILENAME: foxBMS_BMS-Slave | | |
| AUTHOR: Fraunhofer IISB foxBMS Team | | |
| LICENSE: Creative Commons Attribution 4.0  | | |
| DATE: 2017-05-09 | VERSION: 1.0.1 | SHEET: 11/18 |

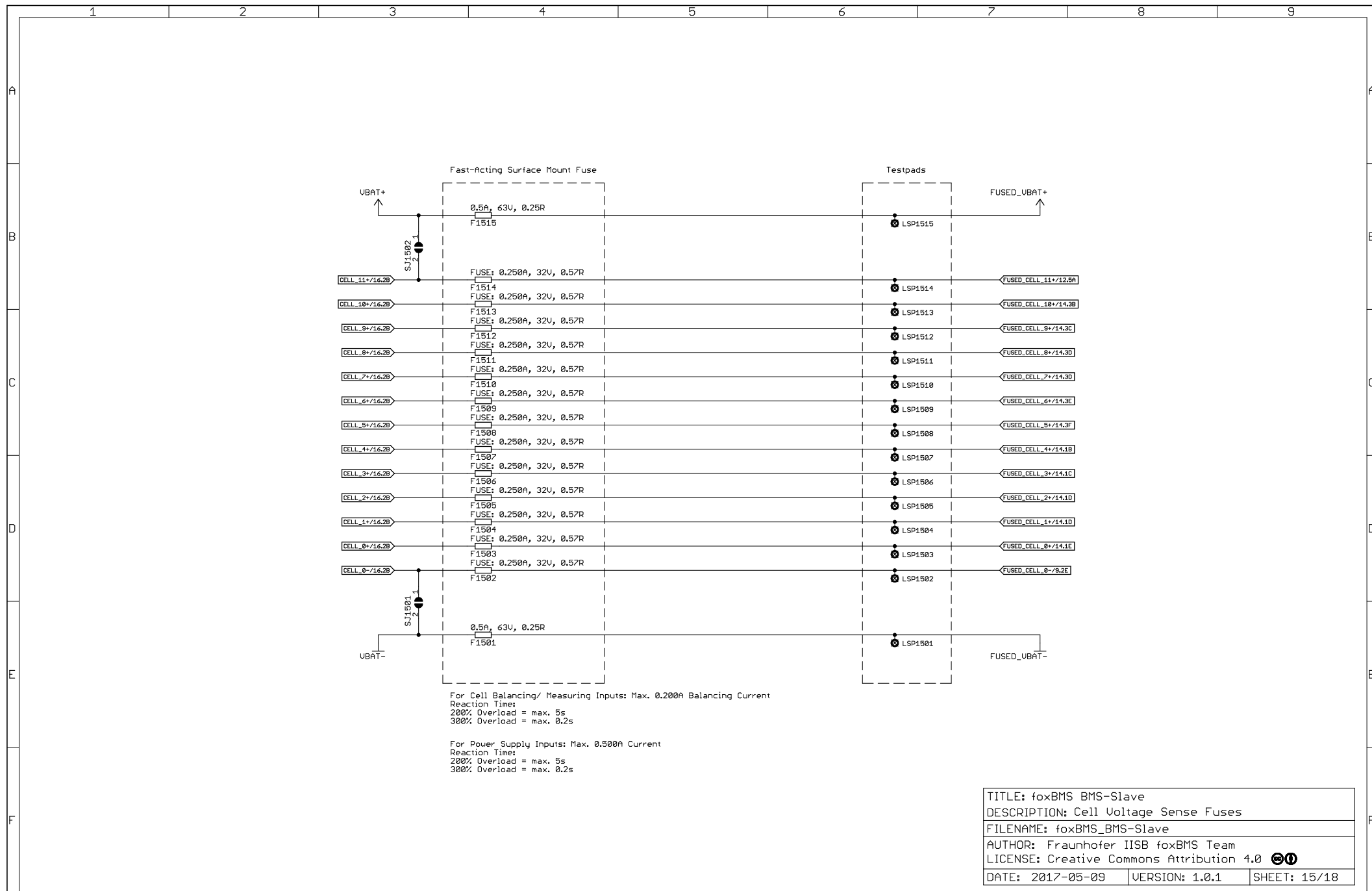


| | | |
|---|----------------|--------------|
| TITLE: foxBMS BMS-Slave | | |
| DESCRIPTION: Passive Cell Balancing | | |
| FILENAME: foxBMS_BMS-Slave | | |
| AUTHOR: Fraunhofer IISB foxBMS Team | | |
| LICENSE: Creative Commons Attribution 4.0  | | |
| DATE: 2017-05-09 | VERSION: 1.0.1 | SHEET: 12/18 |

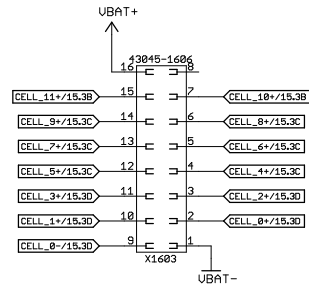
Passive cell balancing controlled by primary LTC6804



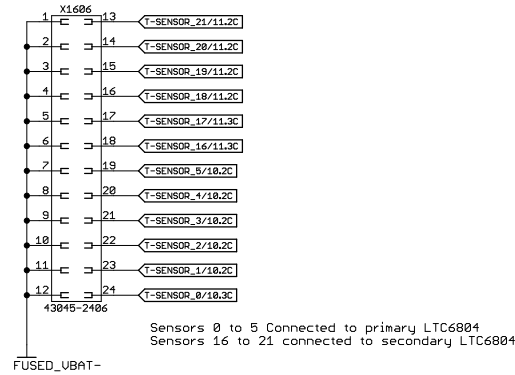




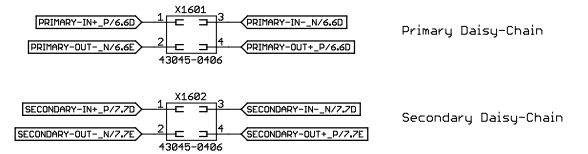
Batterie Cell Voltage Sense Connector



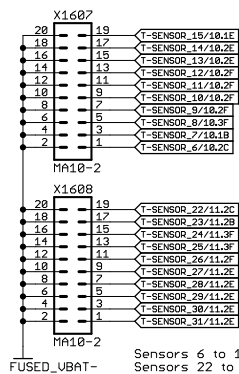
Temperature Sensor Connector



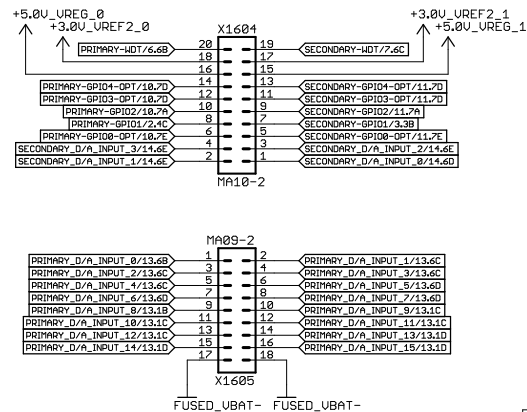
Daisy Chain Connectors




Pin-Header for additional Temperature Sensos



GPIO Connectors



| | | |
|---|----------------|--------------|
| TITLE: foxBMS BMS-Slave | | |
| DESCRIPTION: Connectors | | |
| FILENAME: foxBMS_BMS-Slave | | |
| AUTHOR: Fraunhofer IISB foxBMS Team | | |
| LICENSE: Creative Commons Attribution 4.0  | | |
| DATE: 2017-05-09 | VERSION: 1.0.1 | SHEET: 16/18 |

