

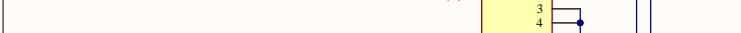
A



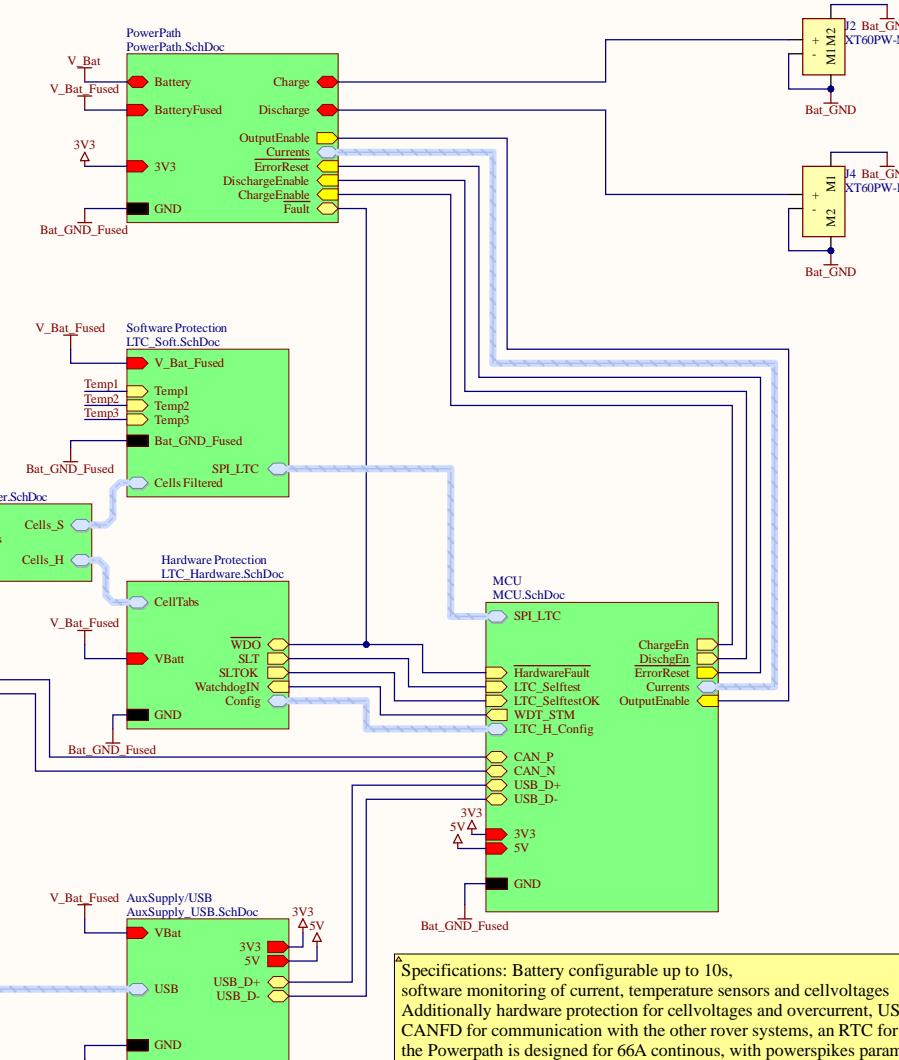
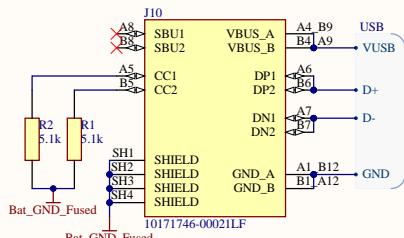
B



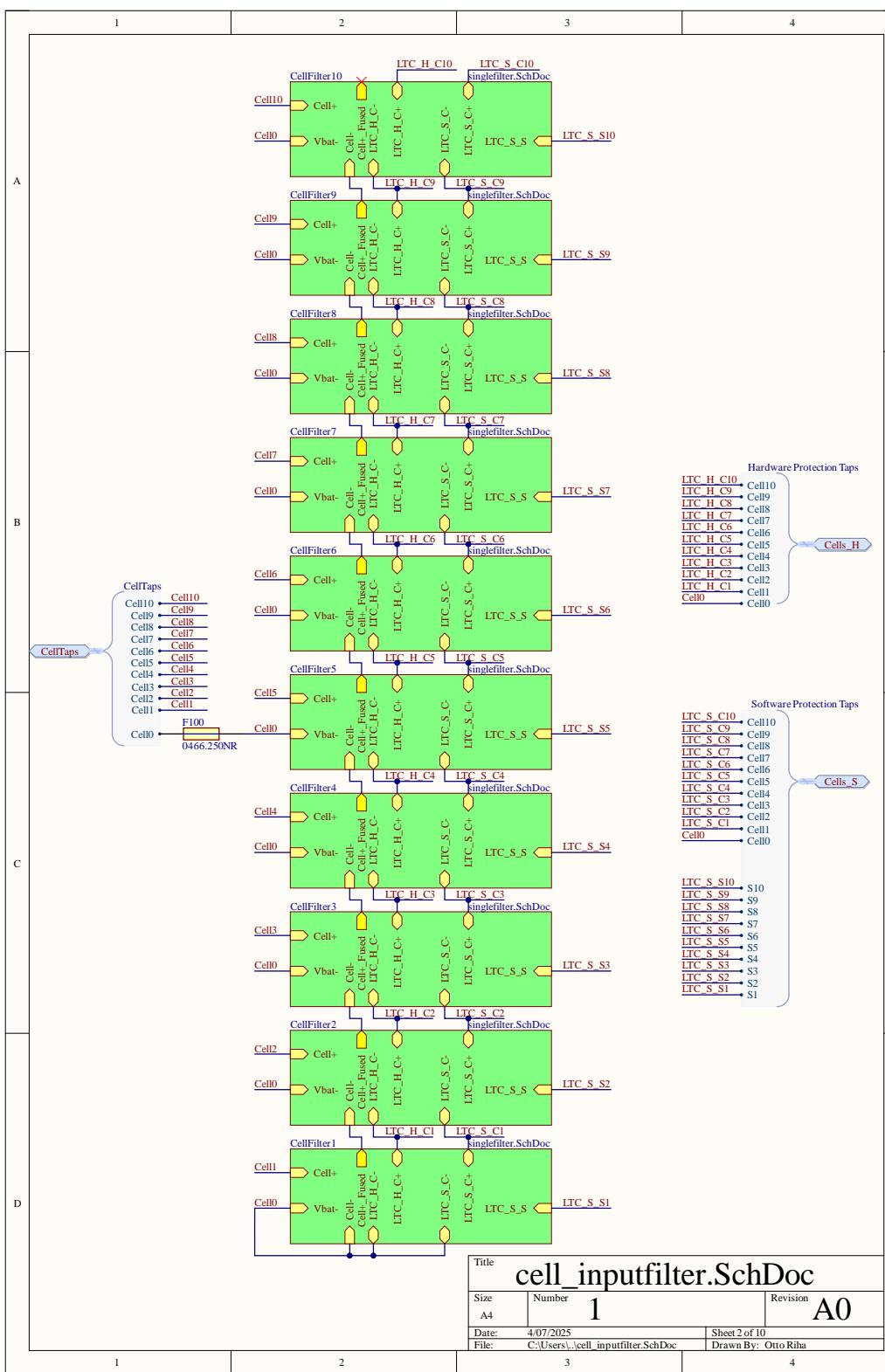
C



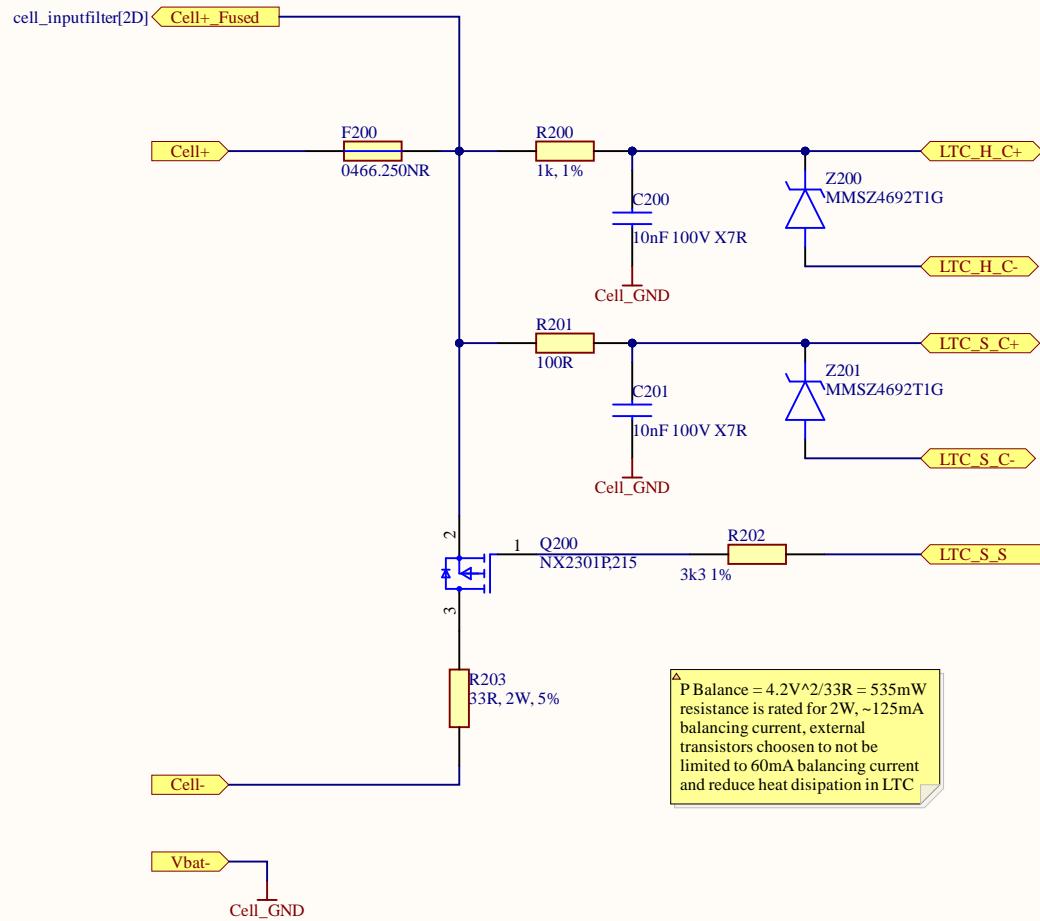
D



Title			Battman Main
Size	Number	Revision	A2
A3	1		
Date:	4/07/2025	Sheet	1 of 9
File:	C:\Users\...\Main.SchDoc	Drawn By:	Otto Riha



A



recommended filtering from LTC 6801 datasheet: 1kOhm 10nF to GND

recommended filter components for maximum measurement accuracy from LTC 6811 datasheet: 100R 10nF, the zeners are there to reduce stress on internal protection circuit

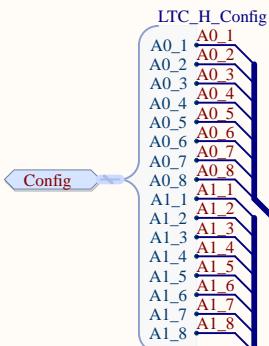
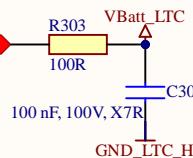
C

P Balance = $4.2V^2/33R = 535mW$
resistance is rated for 2W, ~125mA
balancing current, external
transistors chosen to not be
limited to 60mA balancing current
and reduce heat dissipation in LTC

D

Title singlefilter.SchDoc		
Size A4	Number 1	Revision A1
Date: 4/07/2025	Sheet 3 of 10	
File: C:\Users\..\singlefilter.SchDoc	Drawn By: Otto Riha	

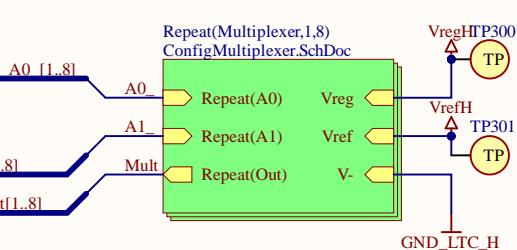
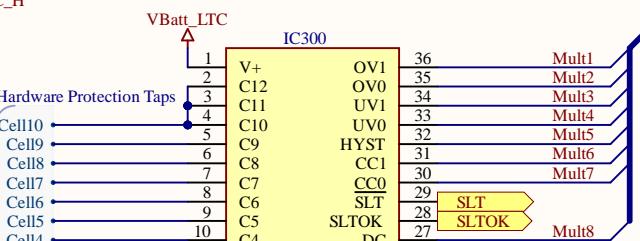
A



	DC	NOMINAL CYCLE TIME*
V _{REG}		15.5ms
V _{REF}		Approximately 130ms
V ⁻		Approximately 500ms

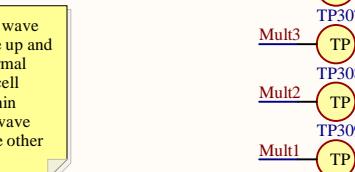
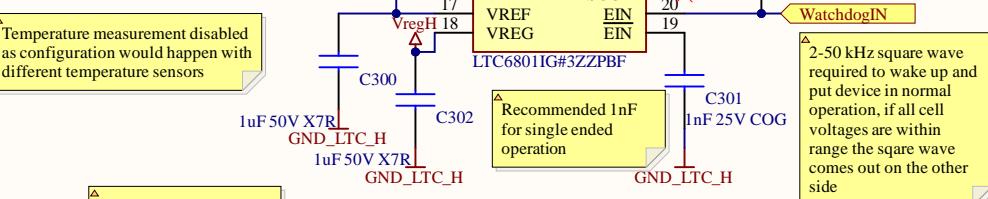
OV1	OV0	OVERVOLTAGE THRESHOLD (V)
V _{REG}	V _{REG}	4.498
V _{REG}	V _{REF}	4.403
V _{REG}	V ⁻	4.307
V _{REF}	V _{REG}	4.211
V _{REF}	V _{REF}	4.116
V _{REF}	V ⁻	4.020
V ⁻	V _{REG}	3.924
V ⁻	V _{REF}	3.828
V ⁻	V ⁻	3.733

B



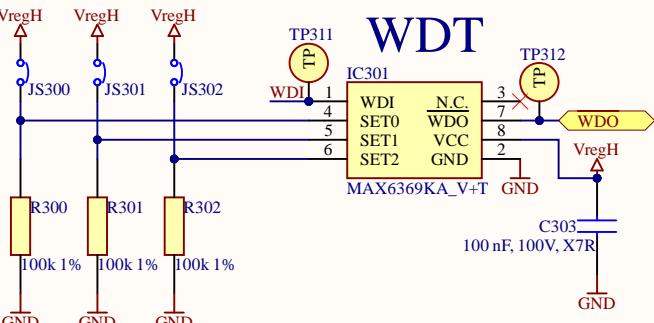
UV1	UV0	UNDERVOLTAGE THRESHOLD (V)
V _{REG}	V _{REG}	2.871
V _{REG}	V _{REF}	2.680
V _{REG}	V ⁻	2.489
V _{REF}	V _{REG}	2.297
V _{REF}	V _{REF}	2.106
V _{REF}	V ⁻	1.914
V ⁻	V _{REG}	1.723
V ⁻	V _{REF}	1.531
V ⁻	V ⁻	0.766

C



CC1	CC0	CELL COUNT
V _{REG}	V _{REG}	12
V _{REG}	V _{REF}	11
V _{REG}	V ⁻	10
V _{REF}	V _{REG}	9
V _{REF}	V _{REF}	8
V _{REF}	V ⁻	7
V ⁻	V _{REG}	6
V ⁻	V _{REF}	5
V ⁻	V ⁻	4

D



LOGIC INPUTS			MAX6369/MAX6370
SET2	SET1	SET0	t _{DELAY} , t _{WD}
0	0	0	1ms
0	0	1	10ms
0	1	0	30ms
0	1	1	Disabled
1	0	0	100ms
1	0	1	1s
1	1	0	10s
1	1	1	60s

HYST	UV HYSTERESIS*	OV HYSTERESIS
V _{REG}	500mV	200mV
V _{REF}	250mV	100mV
V ⁻	0mV	0mV

Title		LTC_Hardware.SchDoc
Size	Number	Revision
A4	1	A1
Date:	4/07/2025	Sheet 4 of 10
File:	C:\Users\...\LTC_Hardware.SchDoc	Drawn By: Otto Riha

A

B

C

D

A

A

B

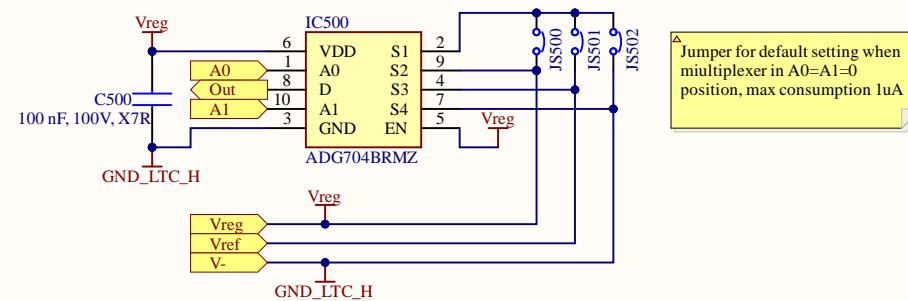
B

C

C

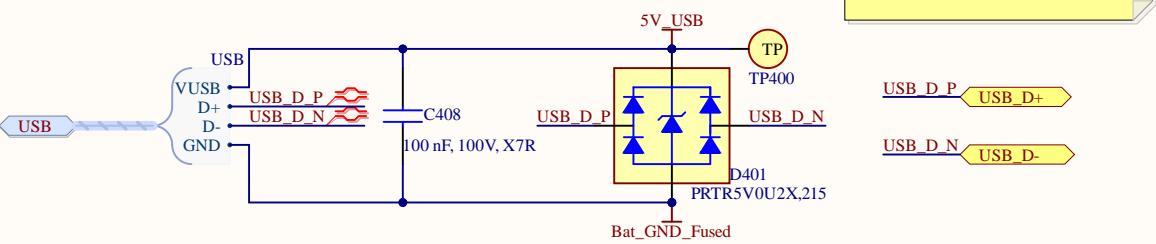
D

D

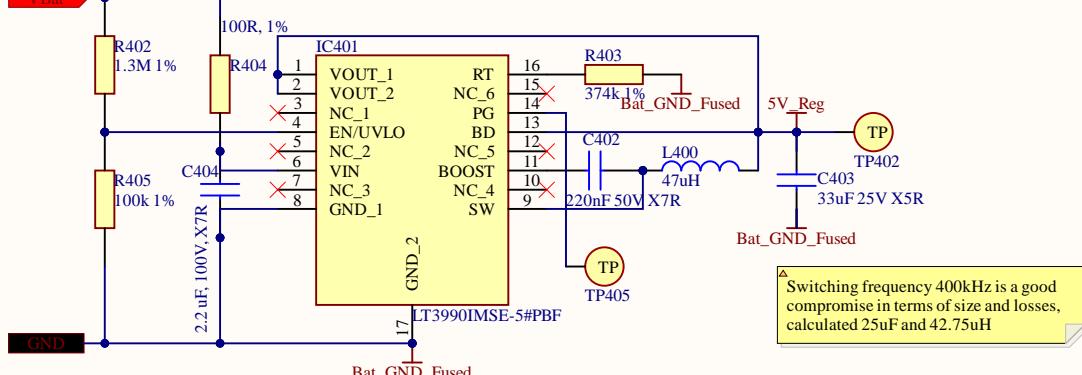


Title		
ConfigMultiplexer.SchDoc		
Size A4	Number 1	Revision A1
Date: 4/07/2025		Sheet 5 of 10
File: C:\Users\..\ConfigMultiplexer.SchDoc		Drawn By: Otto Riha

USB INPUT Protection



5VDC From VBatt



Undervoltage Lockup configured for 16.7V which corresponds to 2.4V/ cell on 7s and is an additional measure against deep discharge

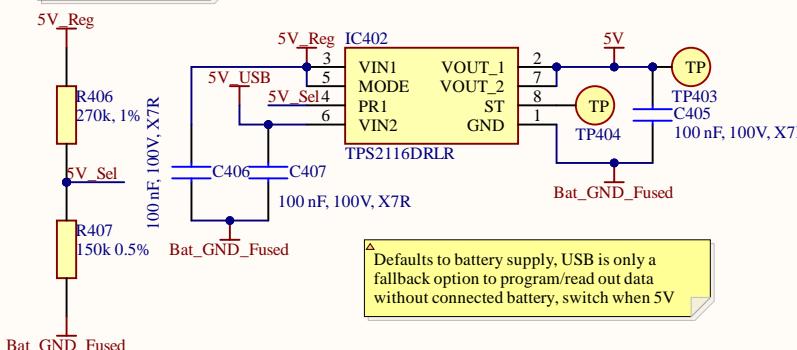
$$L = 3 \frac{V_{OUT} + V_D}{f_{SW}}$$

$$C_{OUT} = \frac{50}{V_{OUT} \cdot f_{SW}}$$

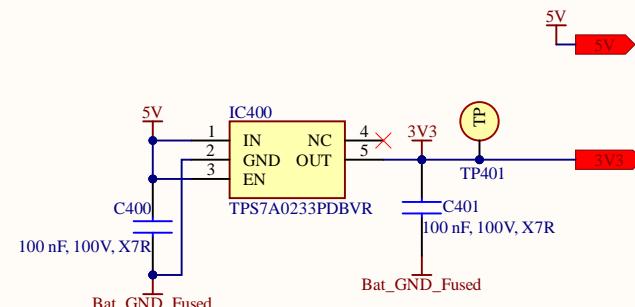
Consumption on 5V:
3.3V LDO 70.1mA
CAN Transceiver 110mA

Total 170.1mA

5V Selector

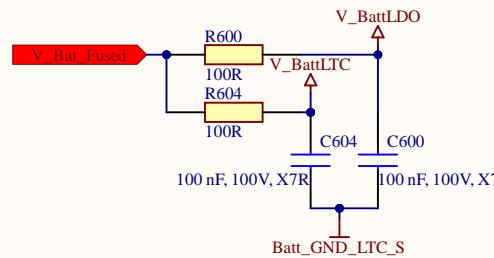


3,3V LDO



Title AuxSupply_USB.SchDoc		
Size A4	Number 1	Revision A1
Date: 4/07/2025	Sheet 6 of 10	
File: C:\Users\..\AuxSupply_USB.SchDoc	Drawn By: Otto Riha	

A



V_BattLDO

IC600

Software Protection Taps

Cell10	7
S10	8
Cell9	9
S9	10
Cell8	11
S8	12
Cell7	13
S7	14
Cell6	15
S6	16
Cell5	17
S5	18
Cell4	19
S4	20
Cell3	21
S3	22
Cell2	23
S2	24
Cell1	S1
Cell0	C1

V+
 C12
 S12
 C11
 S11
 C10
 S10
 C9
 S9
 C8
 S8
 Cell7
 S7
 Cell6
 S6
 Cell5
 S5
 Cell4
 S4
 Cell3
 S3
 Cell2
 S2
 Cell1
 S1
 Cell0
 LTC6811IG-2#PBF

TP603 TP604 TP605 TP606

SPI_LTC

MISO MOSI SCK CS

V_BattLDO

Q600 BCP56-16TF

TP

TP600

TP

TP601

TP

TP602

TP

TP603

TP

TP604

TP

TP605

TP

TP606

Transistor can handle 1W which is 28mA at 42V input, enough for the LTC6811-2 consuming 12.3mA in worstcase



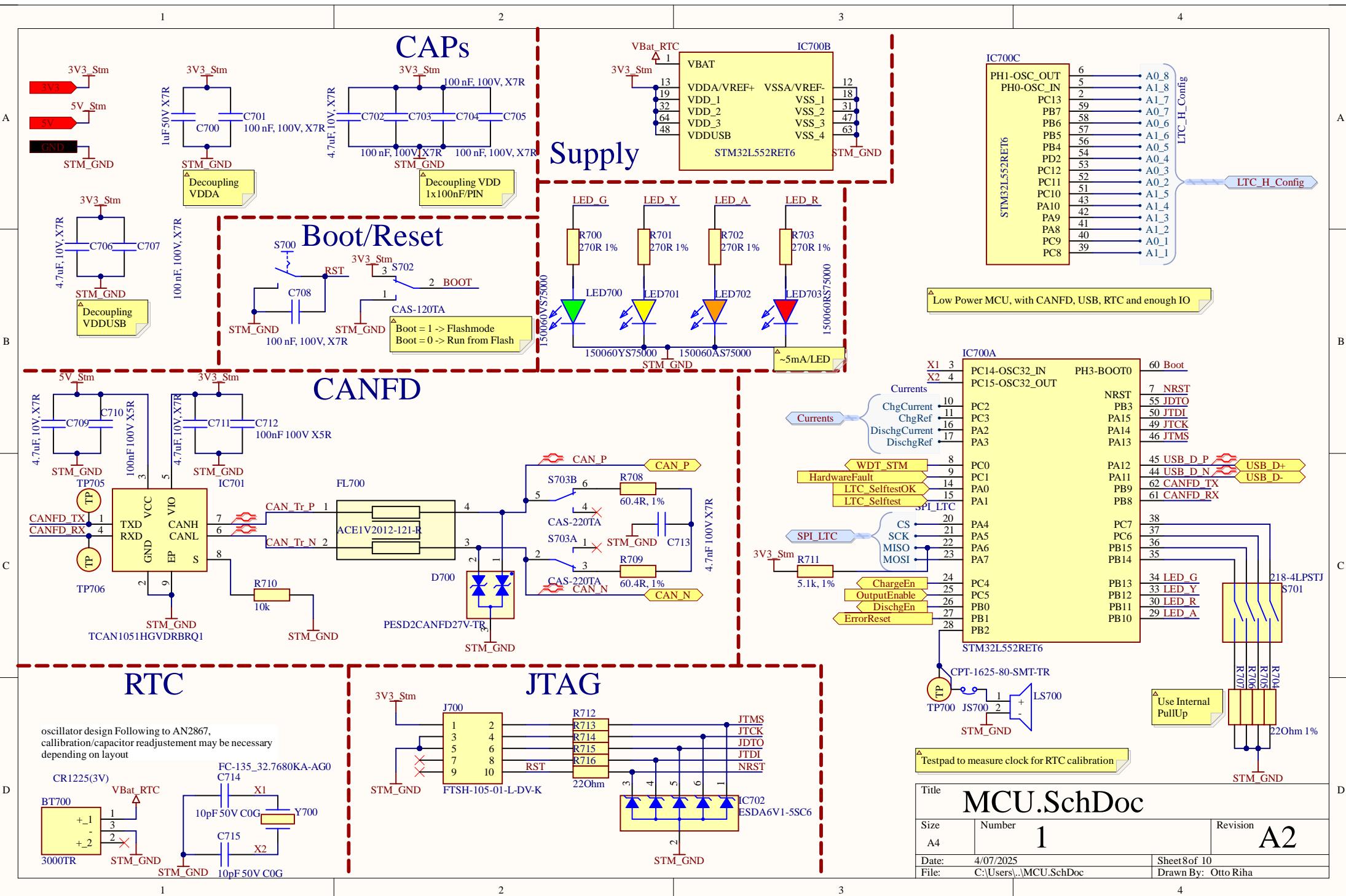
B

Cells Filtered

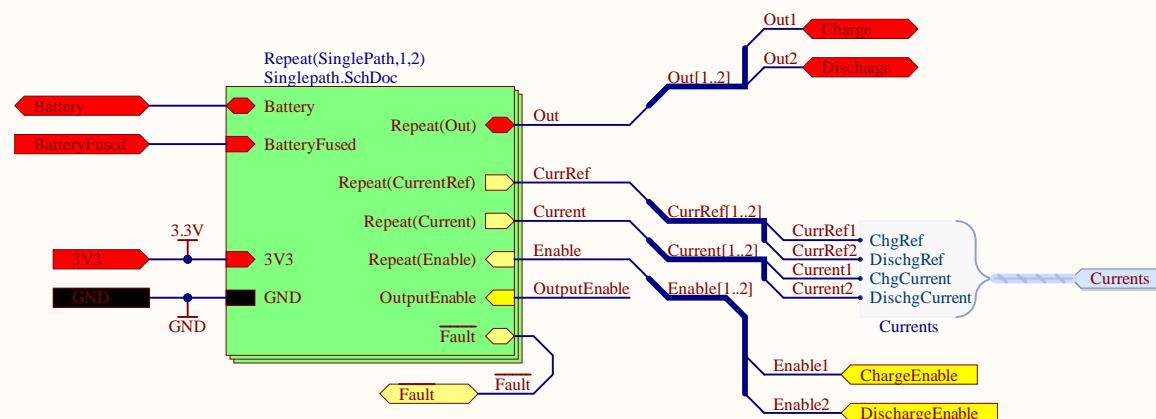
C

D

Title LTC_Soft.SchDoc		
Size A4	Number 1	Revision A1
Date: 4/07/2025	Sheet 7 of 10	
File: C:\Users\...\LTC_Soft.SchDoc		Drawn By: Otto Riha



A

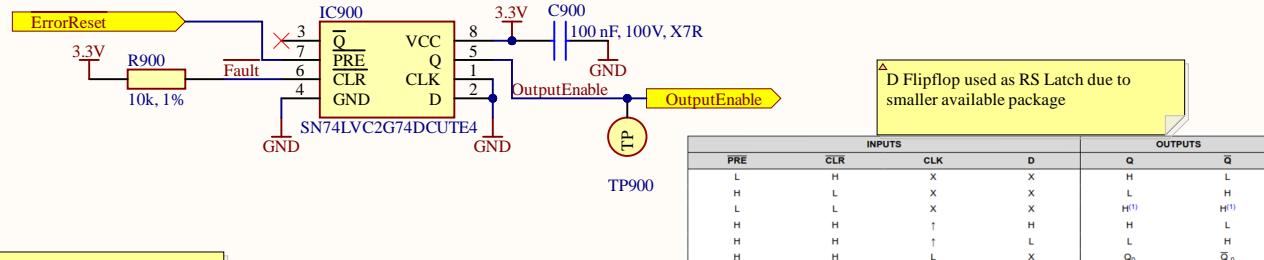


B

C

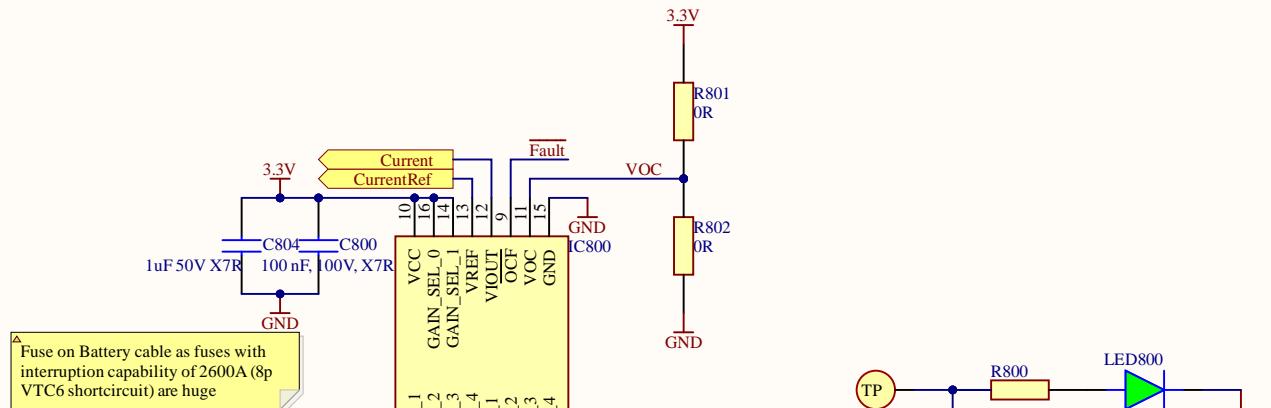
D

Error latch

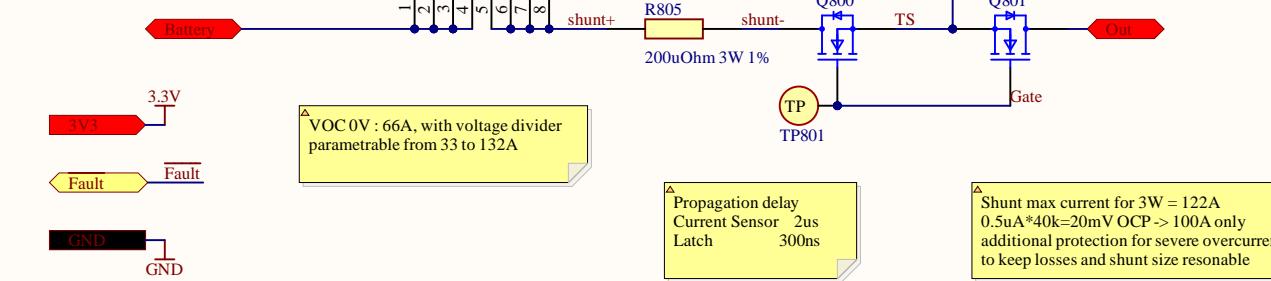


Title		
Size	Number	Revision
A4	1	A1
Date:	4/07/2025	Sheet 9 of 10
File:	C:\Users\..\PowerPath.SchDoc	Drawn By: Otto Riha

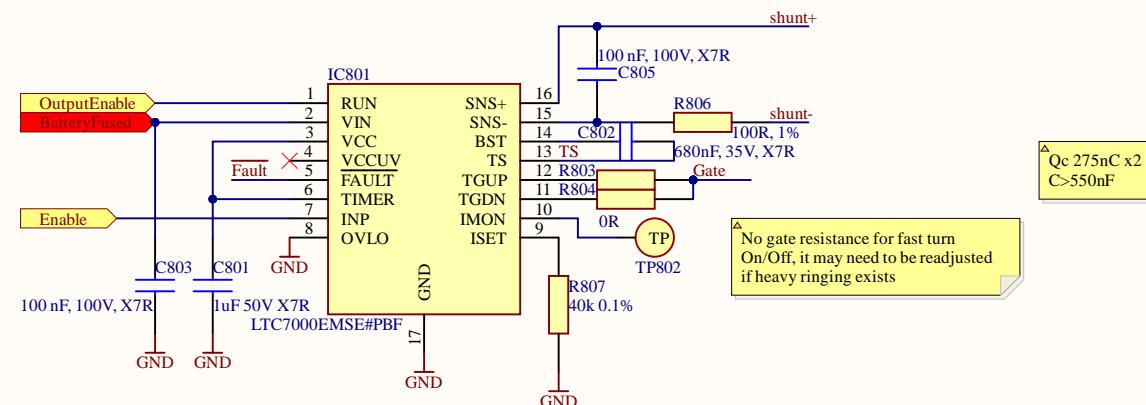
A



B



C



D

Title Singlepath.SchDoc		
Size A4	Number 1	Revision A2
Date: 4/07/2025	Sheet 1 of 10	
File: C:\Users\...\Singlepath.SchDoc	Drawn By: Otto Riha	

