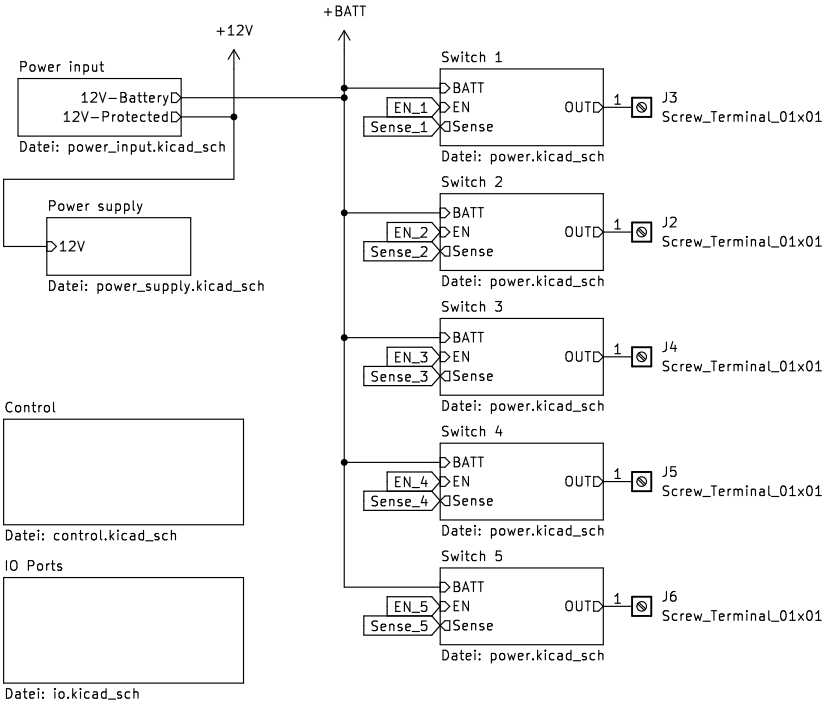
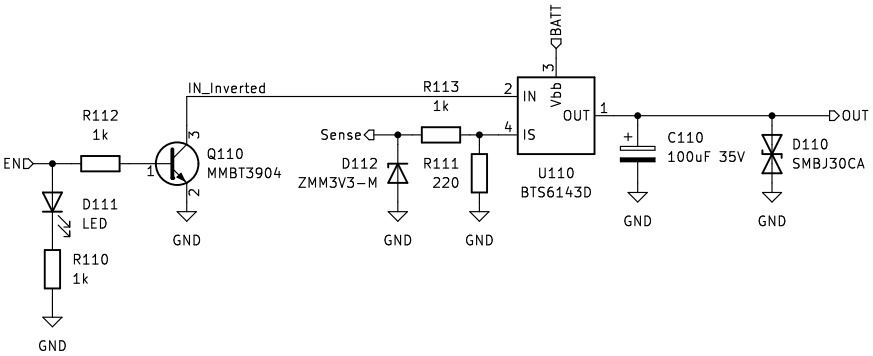


H1
MountingHole

H2
MountingHole

H3
MountingHole

H4
MountingHole



Under higher current (>2.5A) and room temperature (25°C), the typical current sense ratio is 9700.

So the voltage on Sense for each Ampere is about

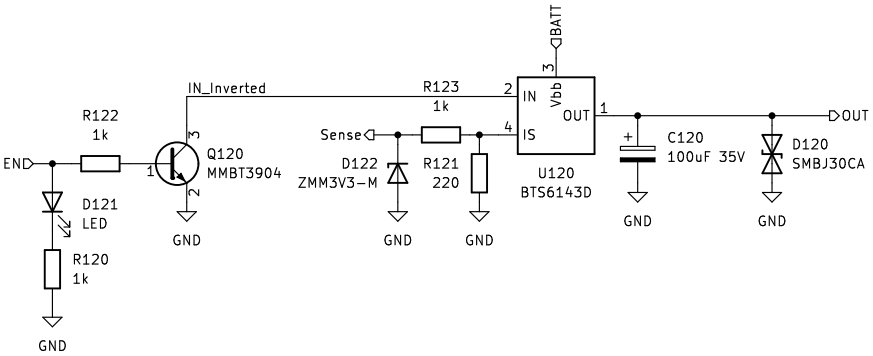
$U = R*I / 9700 = 220\Omega * 1A / 9700 = 0.02268V$

The typical current on fault conditions is I_{fault} = 5.2mA, so

$U_{fault} = 220\Omega * 5.2mA = 1.144V$

The maximum sense current is 7.5mA, so

$U_{max} = 220\Omega * 7.5mA = 1.65V$



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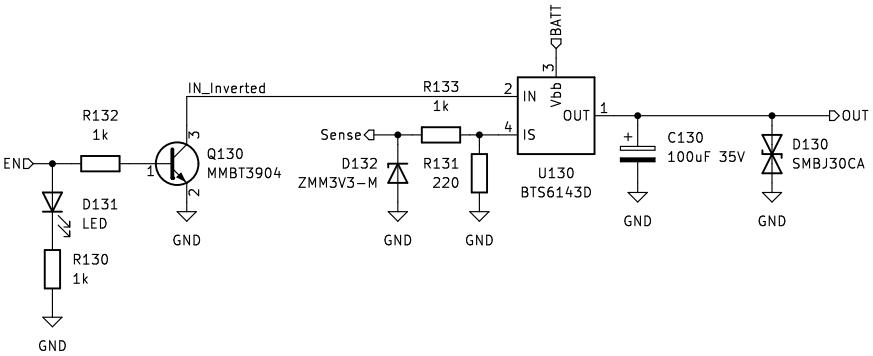

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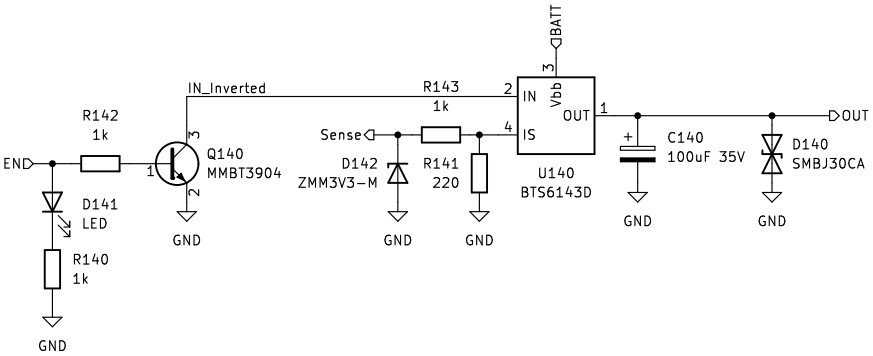

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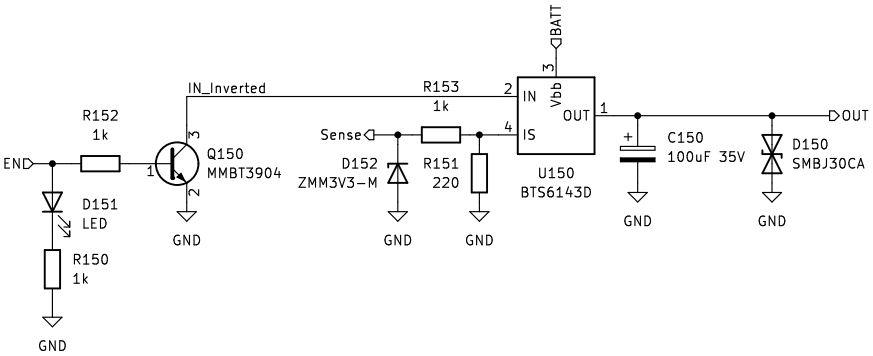

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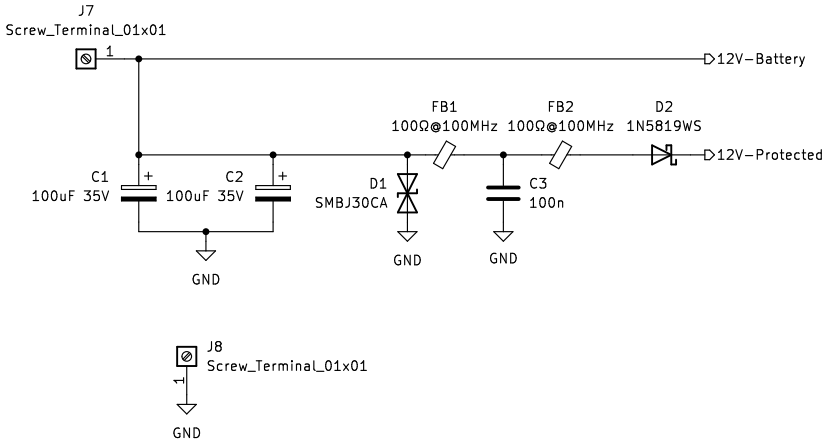
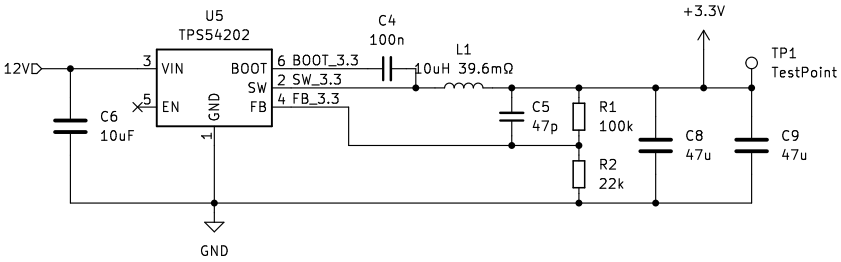
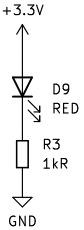
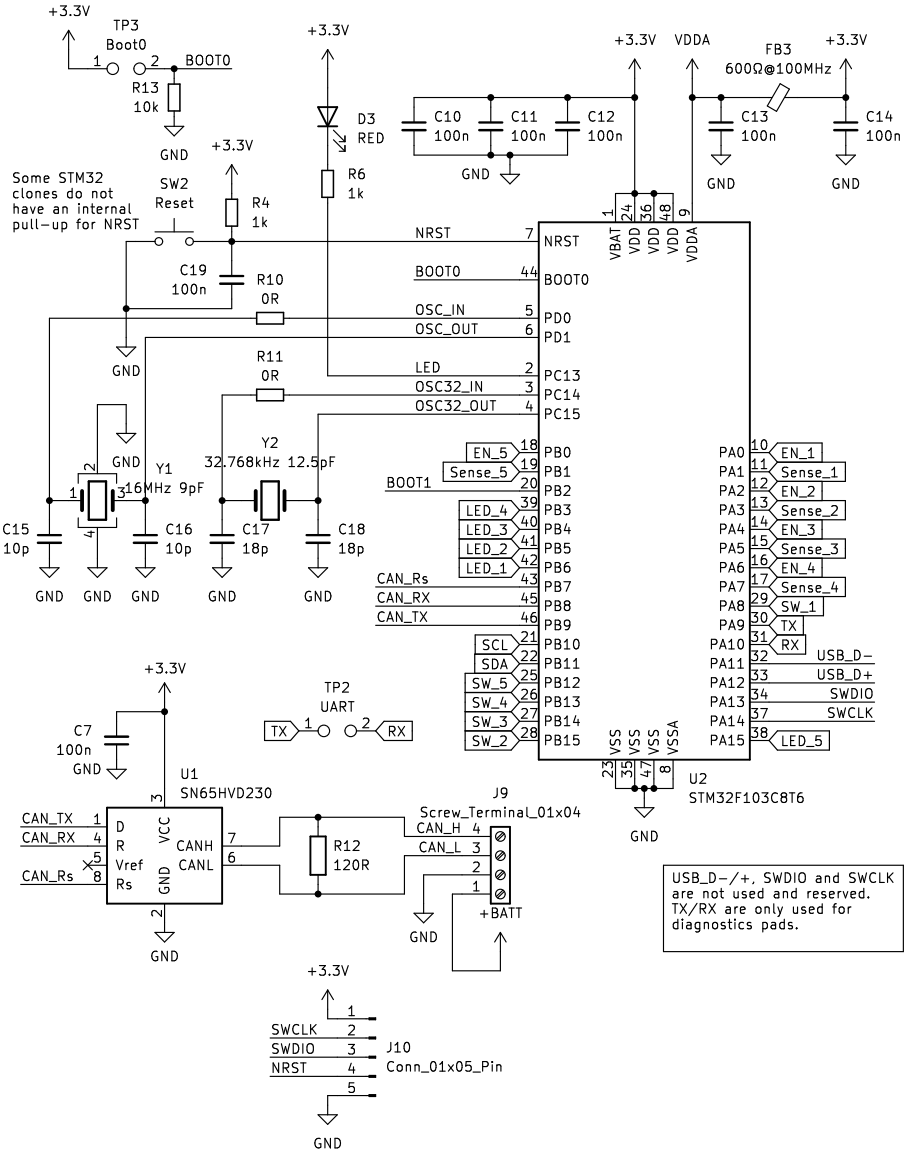
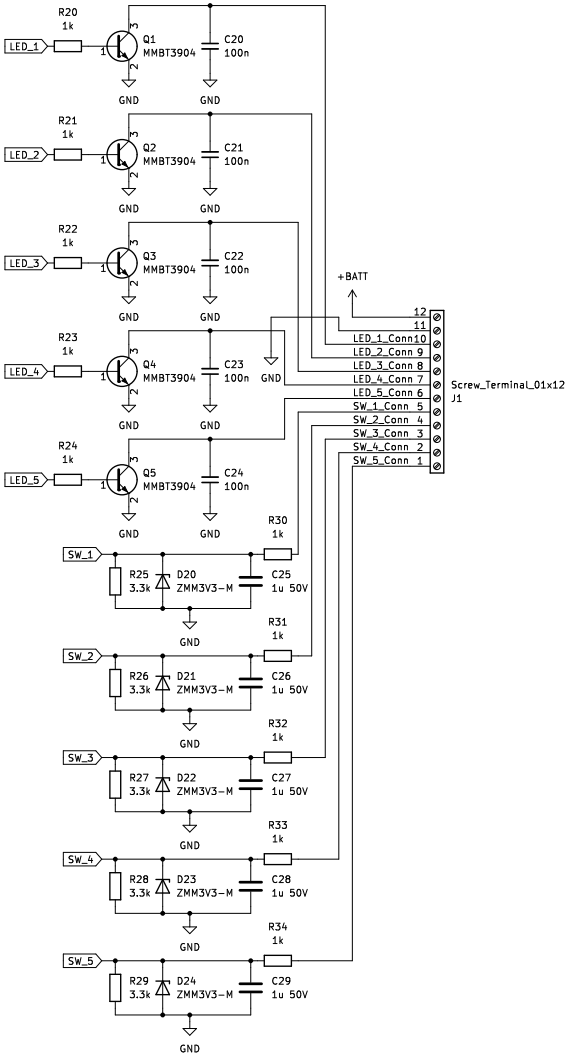

J7
Screw_Terminal_01x01
1
12V–Battery
FB1
100Ω@100MHz
FB2
100Ω@100MHz
D2
1N5819WS
12V–Protected
C1
100uF 35V
C2
100uF 35V
D1
SMBJ30CA
C3
100n
GND
GND
GND
J8
Screw_Terminal_01x01
1
GND


U5
TPS54202
C4
100n
L1
10uH 39.6mΩ
+3.3V
TP1
TestPoint
12VD
3
VIN
BOOT
6 BOOT_3.3
2 SW_3.3
SW
5
EN
GND
FB
4 FB_3.3
1
C6
10uF
C5
47p
R1
100k
C8
47u
C9
47u
R2
22k
GND


+3.3V
D9
RED
R3
1kR
GND


+3.3V
TP3
Boot0
BOOT0
R13
10k
GND
+3.3V
D3
RED
R6
1k
C10
100n
C11
100n
C12
100n
GND
+3.3V
VDDA
FB3
600Ω@100MHz
+3.3V
C13
100n
C14
100n
GND
GND
Some STM32
clones do not
have an internal
pull-up for NRST
SW2
Reset
+3.3V
R4
1k
C19
100n
R10
0R
GND
R11
0R
GND
Y1
16MHz 9pF
Y2
32.768kHz 12.5pF
C15
10p
C16
10p
C17
18p
C18
18p
GND
GND
GND
GND
GND
NRST
BOOT0
OSC_IN
OSC_OUT
LED
OSC32_IN
OSC32_OUT
BOOT1
CAN_Rs
CAN_RX
CAN_TX
SCL
SDA
SW_5
SW_4
SW_3
SW_2
LED_4
LED_3
LED_2
LED_1
EN_5
Sense_5
NRST
BOOT0
PD0
PD1
PC13
PC14
PC15
PB0
PB1
PB2
PB3
PB4
PB5
PB6
PB7
PB8
PB9
PB10
PB11
PB12
PB13
PB14
PB15
VBAT
VDD
VDD
VDD
VDDA
VSS
VSS
VSS
VSSA
PA0
PA1
PA2
PA3
PA4
PA5
PA6
PA7
PA8
PA9
PA10
PA11
PA12
PA13
PA14
PA15
EN_1
Sense_1
EN_2
Sense_2
EN_3
Sense_3
EN_4
Sense_4
SW_1
TX
RX
USB_D−
USB_D+
SWDIO
SWCLK
LED_5
U2
STM32F103C8T6
GND
+3.3V
C7
100n
GND
U1
SN65HVD230
CAN_TX
CAN_RX
CAN_Rs
D
R
Vref
Rs
VCC
GND
CANH
CANL
R12
120R
TP2
UART
TX
RX
J9
Screw_Terminal_01x04
CAN_H
CAN_L
+BATT
GND
GND
+3.3V
SWCLK
SWDIO
NRST
J10
Conn_01x05_Pin
GND
USB_D−/+, SWDIO and SWCLK
are not used and reserved.
TX/RX are only used for
diagnostics pads.


R20
1k
LED_1
Q1
MMBT3904
C20
100n
GND
GND
R21
1k
LED_2
Q2
MMBT3904
C21
100n
GND
GND
R22
1k
LED_3
Q3
MMBT3904
C22
100n
GND
GND
+BATT
R23
1k
LED_4
Q4
MMBT3904
C23
100n
GND
GND
GND
R24
1k
LED_5
Q5
MMBT3904
C24
100n
GND
GND
12
11
LED_1_Conn 10
LED_2_Conn 9
LED_3_Conn 8
LED_4_Conn 7
LED_5_Conn 6
SW_1_Conn 5
SW_2_Conn 4
SW_3_Conn 3
SW_4_Conn 2
SW_5_Conn 1
Screw_Terminal_01x12
J1
R30
1k
SW_1
R25
3.3k
D20
ZMM3V3-M
C25
1u 50V
GND
R31
1k
SW_2
R26
3.3k
D21
ZMM3V3-M
C26
1u 50V
GND
R32
1k
SW_3
R27
3.3k
D22
ZMM3V3-M
C27
1u 50V
GND
R33
1k
SW_4
R28
3.3k
D23
ZMM3V3-M
C28
1u 50V
GND
R34
1k
SW_5
R29
3.3k
D24
ZMM3V3-M
C29
1u 50V
GND