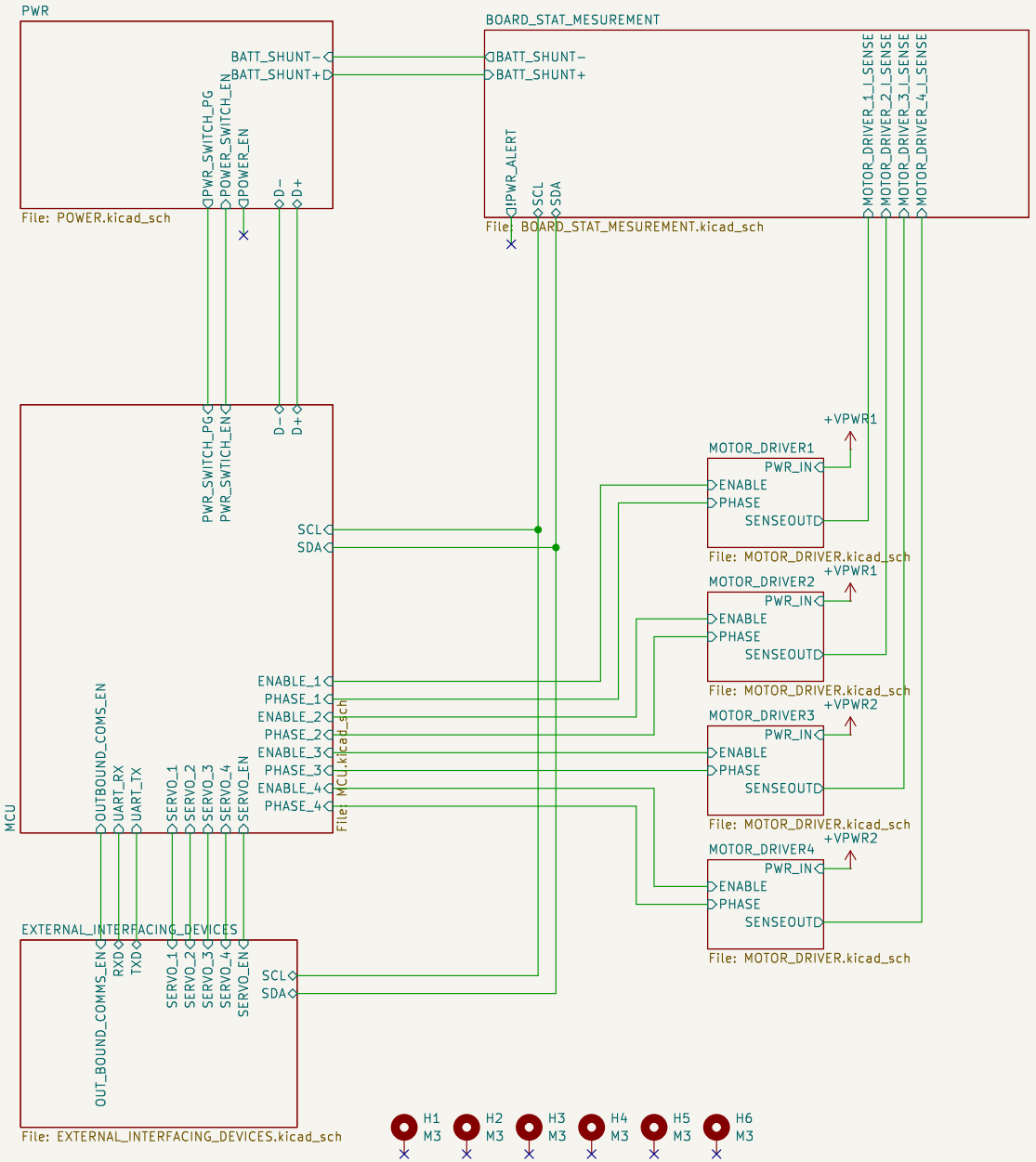


CHANGE LOG

Sheet: /
File: esp32-racer.kicad_sch

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| Size: A4 | Date: | **Rev:** |
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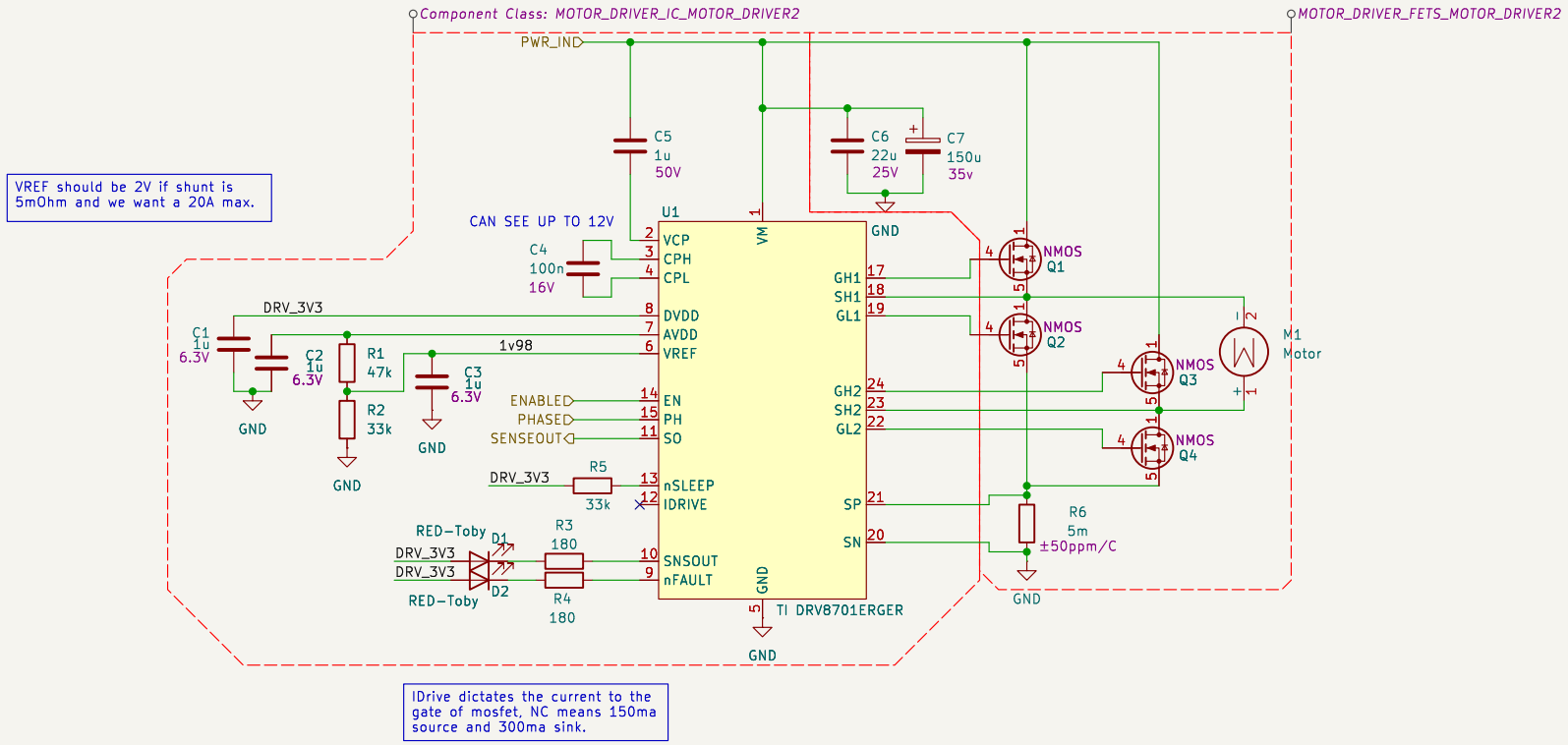
| KiCad E.D.A. 9.0.8 | | Id: 1/10 |

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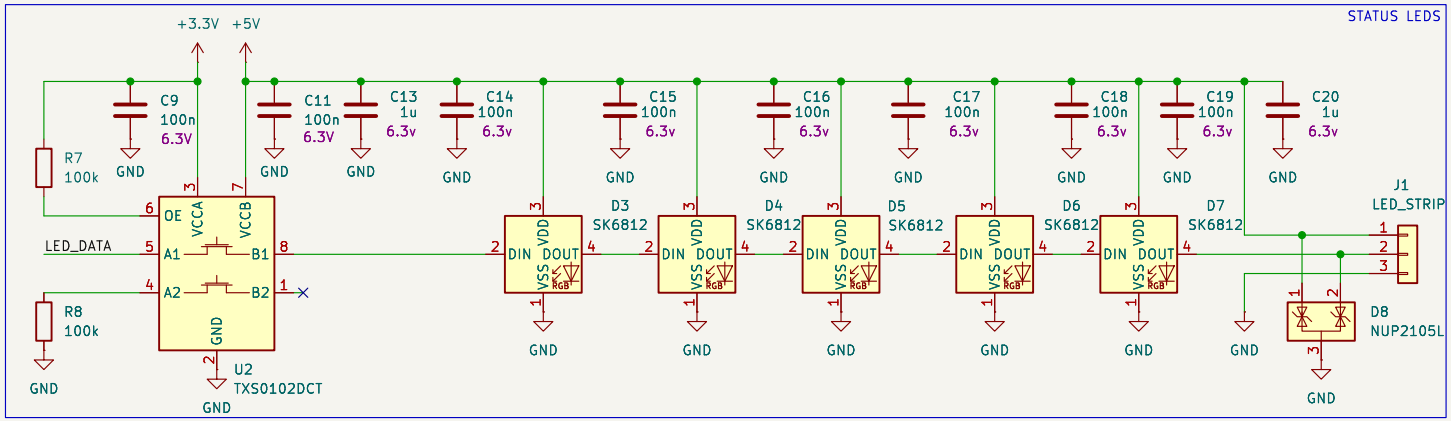
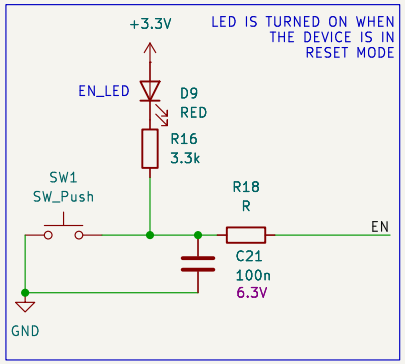
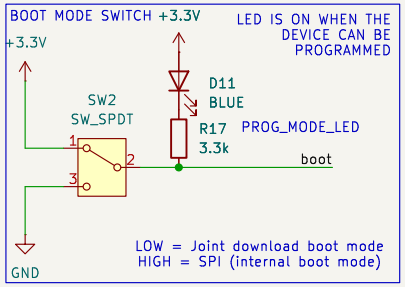
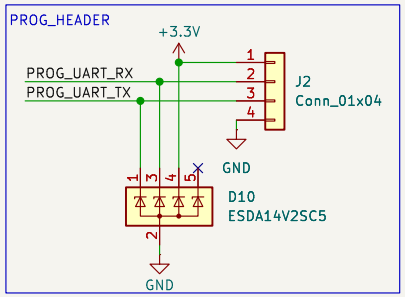
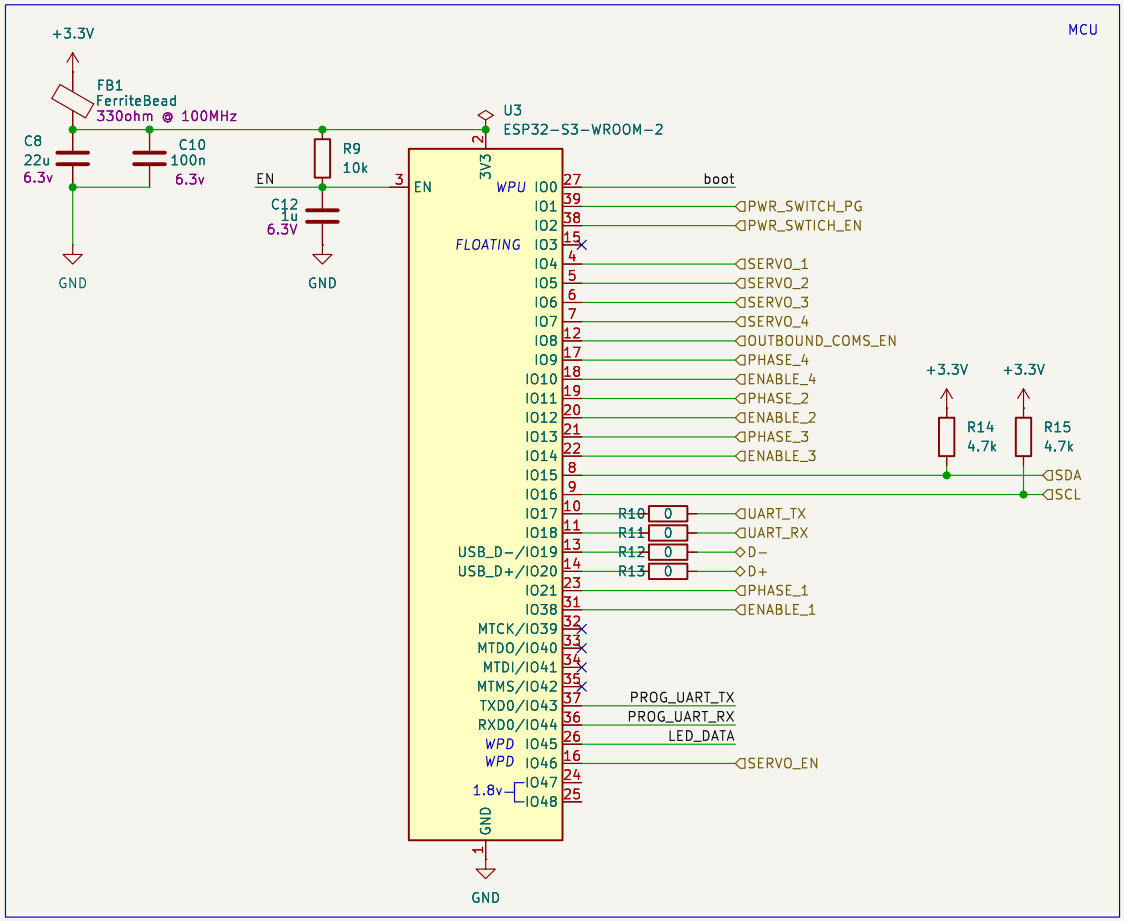
| Sheet: /MOTOR_DRIVER2/ | | |
| File: MOTOR_DRIVER.kicad_sch | | |
| **Title:** | | |
| Size: A4 | Date: | **Rev:** |
| KiCad E.D.A. 9.0.8 | | Id: 2/10 |



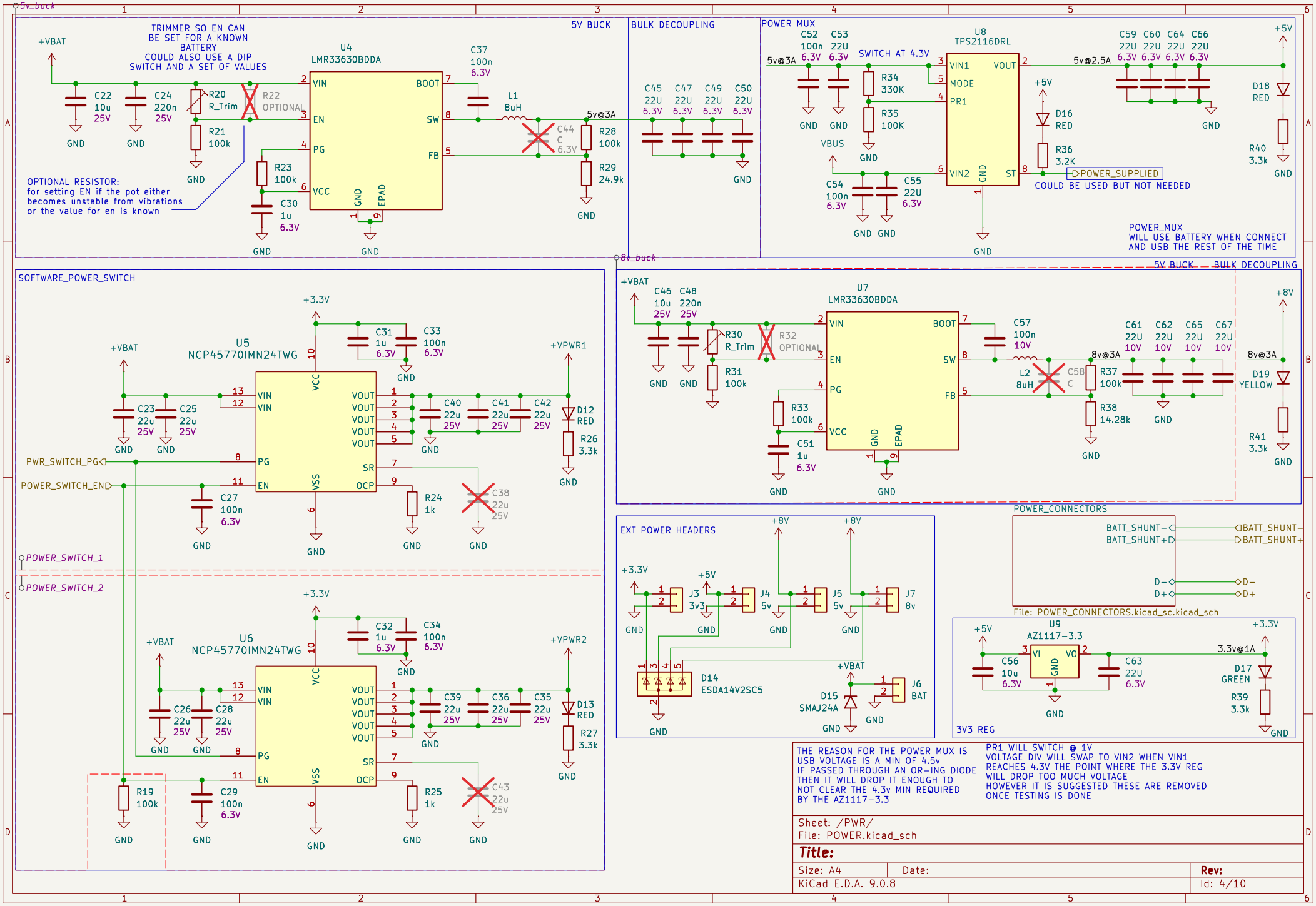



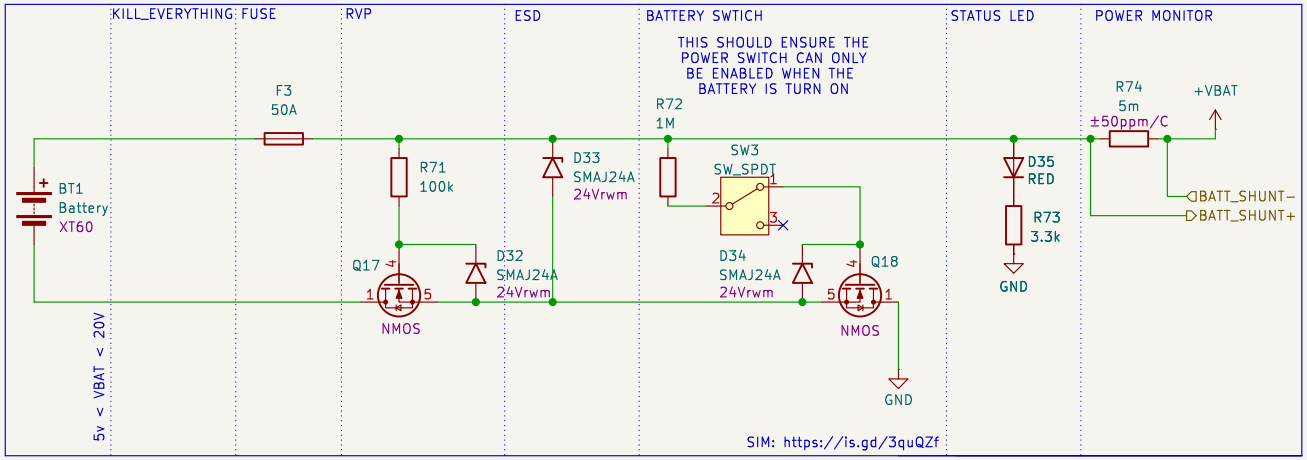



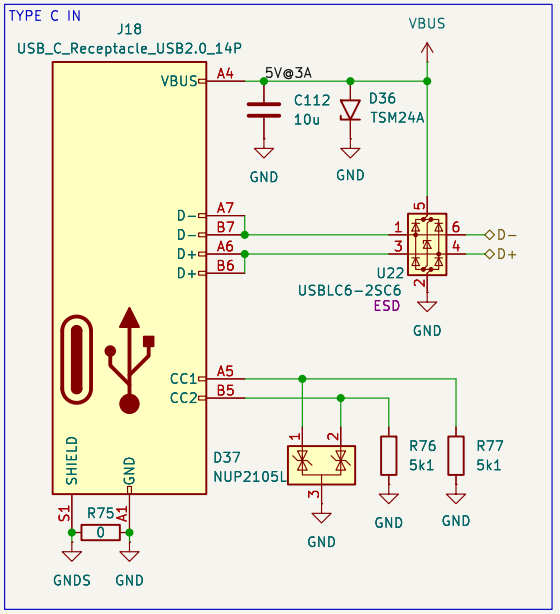

Sheet: /MCU/
File: MCU.kicad_sch

**Title:**

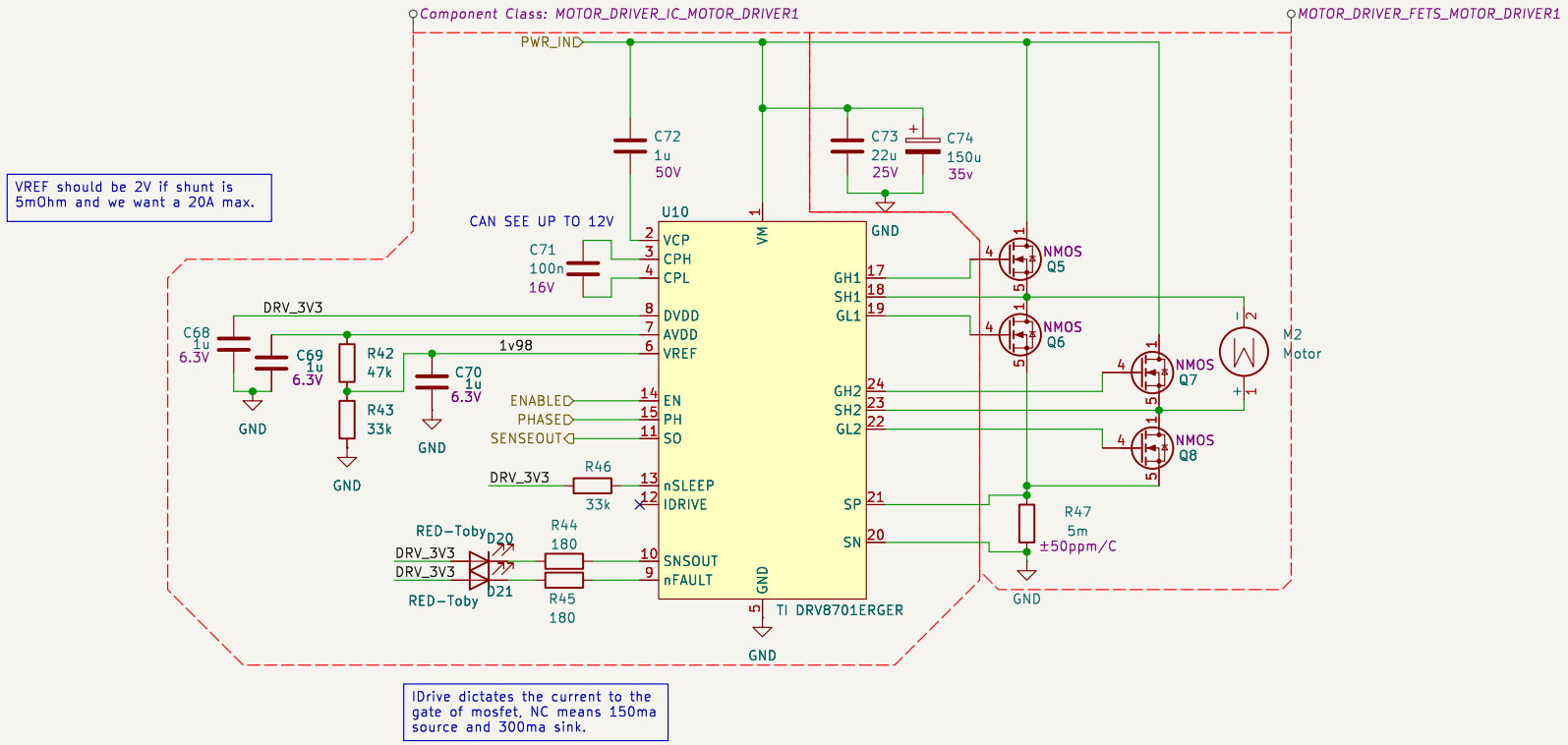
| Size: A4 | Date: | **Rev:** |
|---|---|---|
| KiCad E.D.A. 9.0.8 | | Id: 3/10 |

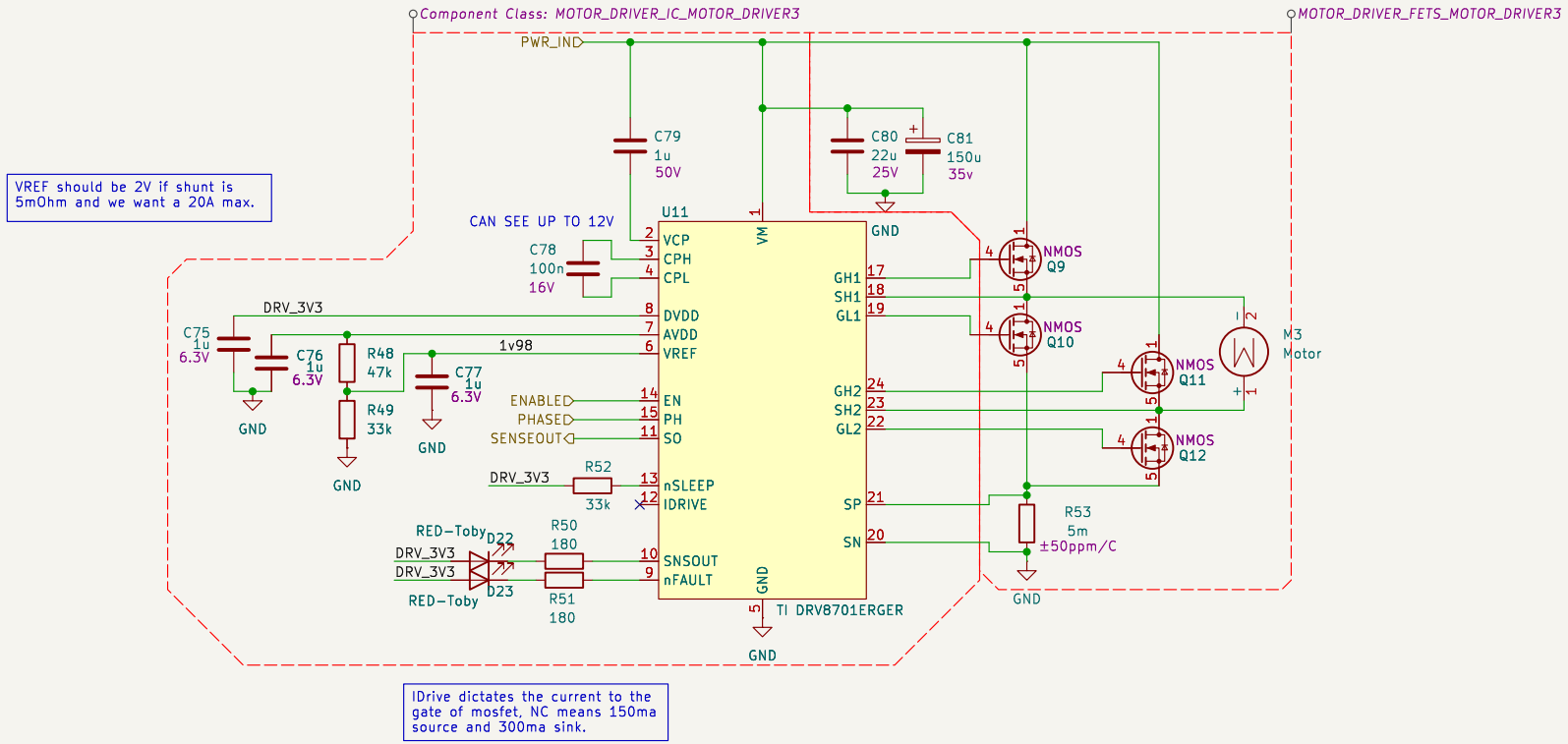

5v_buck
5V BUCK
BULK DECOUPLING
POWER MUX
TRIMMER SO EN CAN BE SET FOR A KNOWN BATTERY COULD ALSO USE A DIP SWITCH AND A SET OF VALUES
+VBAT
U4
LMR33630BDDA
C22 10u 25V
C24 220n 25V
R20 R_Trim
R22 OPTIONAL
R21 100k
R23 100k
C30 1u 6.3V
C37 100n 6.3V
L1 8uH
C44 C 6.3V
R28 100k
R29 24.9k
5v@3A
OPTIONAL RESISTOR:
for setting EN if the pot either becomes unstable from vibrations or the value for en is known
C45 C47 C49 C50
22U 6.3V
U8
TPS2116DRL
C52 100n 6.3V
C53 22U 6.3V
SWITCH AT 4.3V
R34 330K
R35 100K
VBUS
C54 100n 6.3V
C55 22U 6.3V
5v@2.5A
C59 C60 C64 C66
22U 6.3V
D16 RED
R36 3.2K
D18 RED
R40 3.3k
+5V
POWER_SUPPLIED
COULD BE USED BUT NOT NEEDED
POWER_MUX
WILL USE BATTERY WHEN CONNECT AND USB THE REST OF THE TIME
8v_buck
5V BUCK
BULK DECOUPLING
U7
LMR33630BDDA
C46 10u 25V
C48 220n 25V
R30 R_Trim
R32 OPTIONAL
R31 100k
R33 100k
C51 1u 6.3V
C57 100n 10V
L2 8uH
C58 C
R37 100k
R38 14.28k
8v@3A
C61 C62 C65 C67
22U 10V
D19 YELLOW
R41 3.3k
+8V
SOFTWARE_POWER_SWITCH
U5
NCP45770IMN24TWG
+3.3V
C31 1u 6.3V
C33 100n 6.3V
C23 22u 25V
C25 22u 25V
C40 22u 25V
C41 22u 25V
C42 22u 25V
D12 RED
R26 3.3k
+VPWR1
PWR_SWITCH_PG
POWER_SWITCH_END
C27 100n 6.3V
R24 1k
C38 22u 25V
POWER_SWITCH_1
POWER_SWITCH_2
U6
NCP45770IMN24TWG
C32 1u 6.3V
C34 100n 6.3V
C26 22u 25V
C28 22u 25V
C39 22u 25V
C36 22u 25V
C35 22u 25V
D13 RED
R27 3.3k
+VPWR2
R19 100k
C29 100n 6.3V
R25 1k
C43 22u 25V
EXT POWER HEADERS
J3 3v3
J4 5v
J5 5v
J7 8v
D14 ESDA14V2SC5
D15 SMAJ24A
J6 BAT
POWER_CONNECTORS
BATT_SHUNT-
BATT_SHUNT+
D-
D+
File: POWER_CONNECTORS.kicad_sc.kicad_sch
U9
AZ1117-3.3
C56 10u 6.3V
C63 22U 6.3V
3.3v@1A
D17 GREEN
R39 3.3k
3V3 REG
THE REASON FOR THE POWER MUX IS USB VOLTAGE IS A MIN OF 4.5v IF PASSED THROUGH AN OR-ING DIODE THEN IT WILL DROP IT ENOUGH TO NOT CLEAR THE 4.3v MIN REQUIRED BY THE AZ1117-3.3
PR1 WILL SWITCH @ 1V VOLTAGE DIV WILL SWAP TO VIN2 WHEN VIN1 REACHES 4.3V THE POINT WHERE THE 3.3V REG WILL DROP TOO MUCH VOLTAGE HOWEVER IT IS SUGGESTED THESE ARE REMOVED ONCE TESTING IS DONE
Sheet: /PWR/
File: POWER.kicad_sch
Title:
Size: A4
Date:
Rev:
KiCad E.D.A. 9.0.8
Id: 4/10

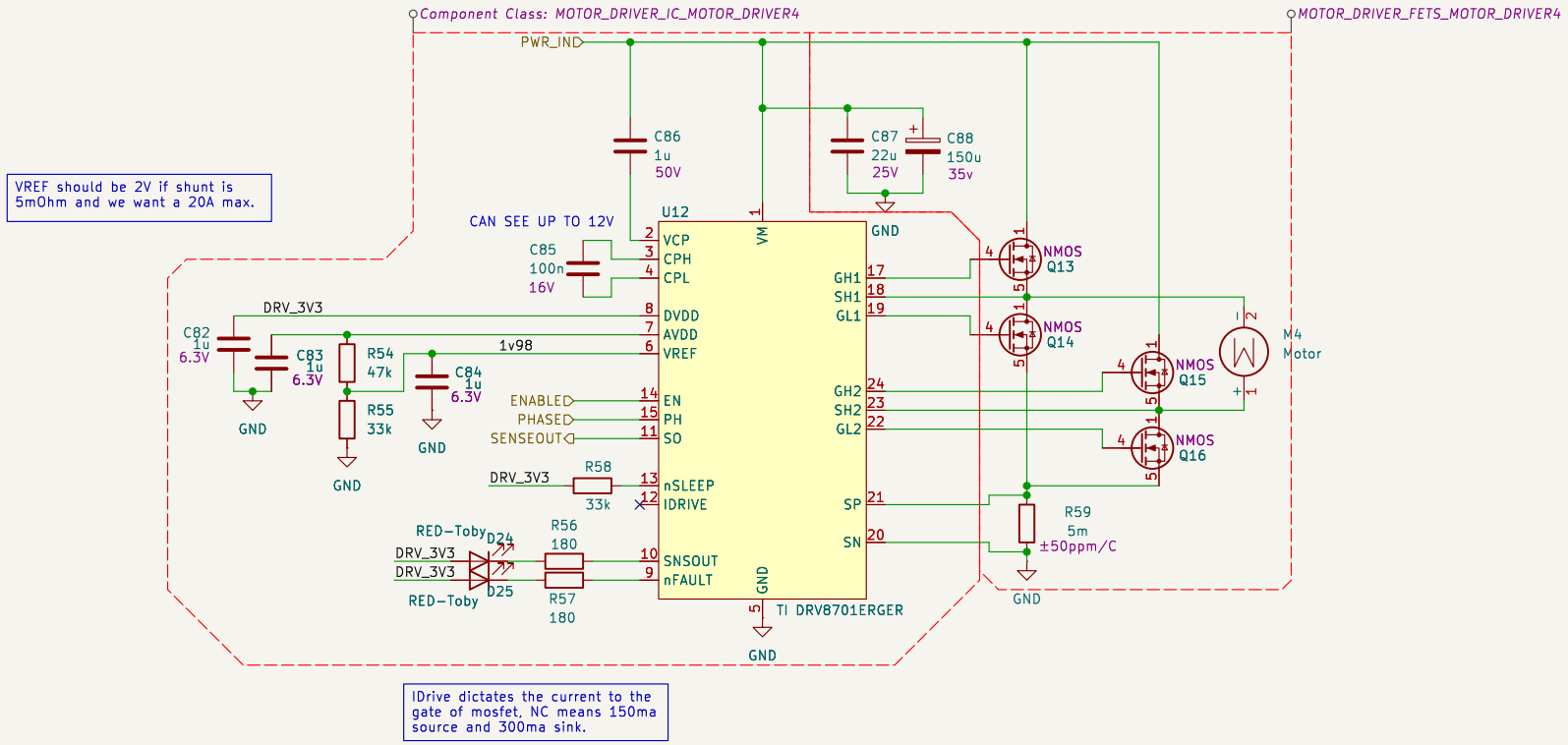


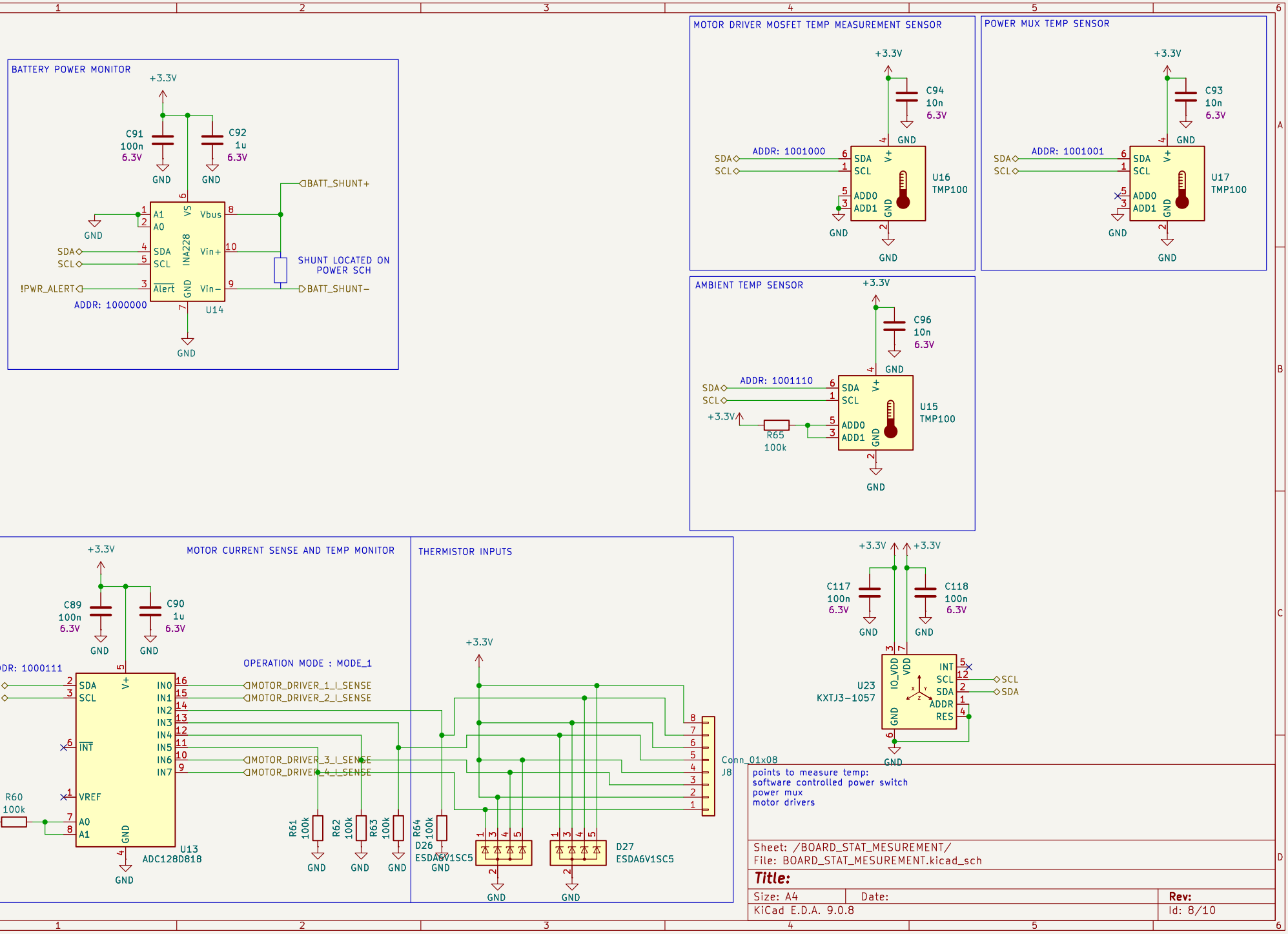



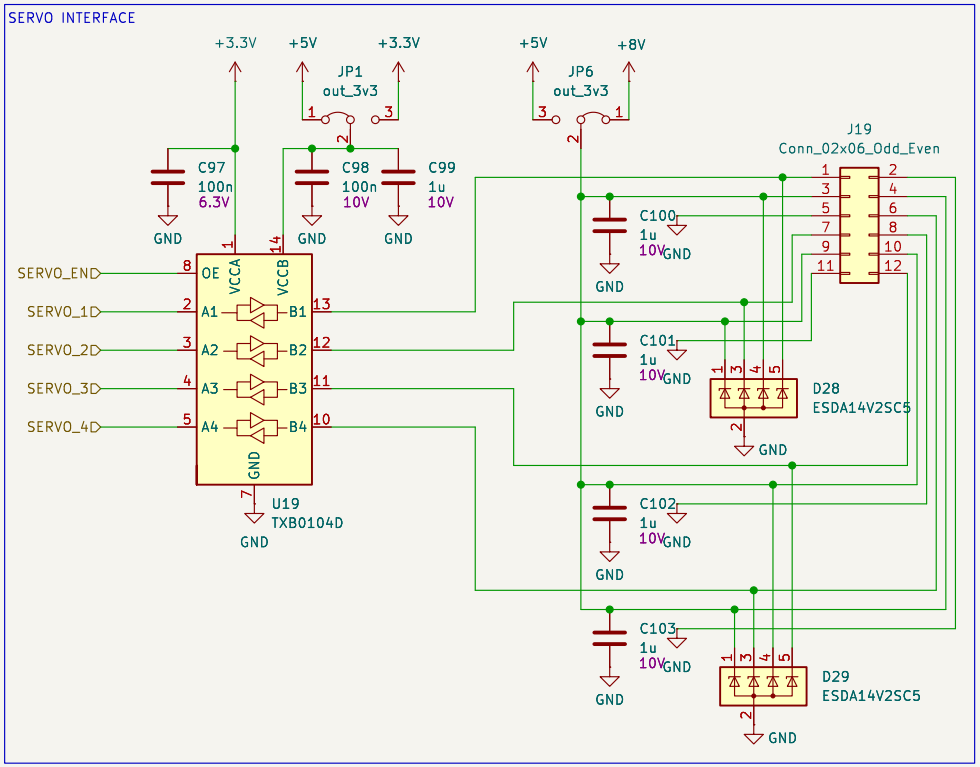

| | | |
|---|---|---|
| Sheet: /PWR/POWER_CONNECTORS/ | | |
| File: POWER_CONNECTORS.kicad_sc.kicad_sch | | |
| **Title:** | | |
| Size: A4 | Date: | **Rev:** |
| KiCad E.D.A. 9.0.8 | | Id: 10/10 |

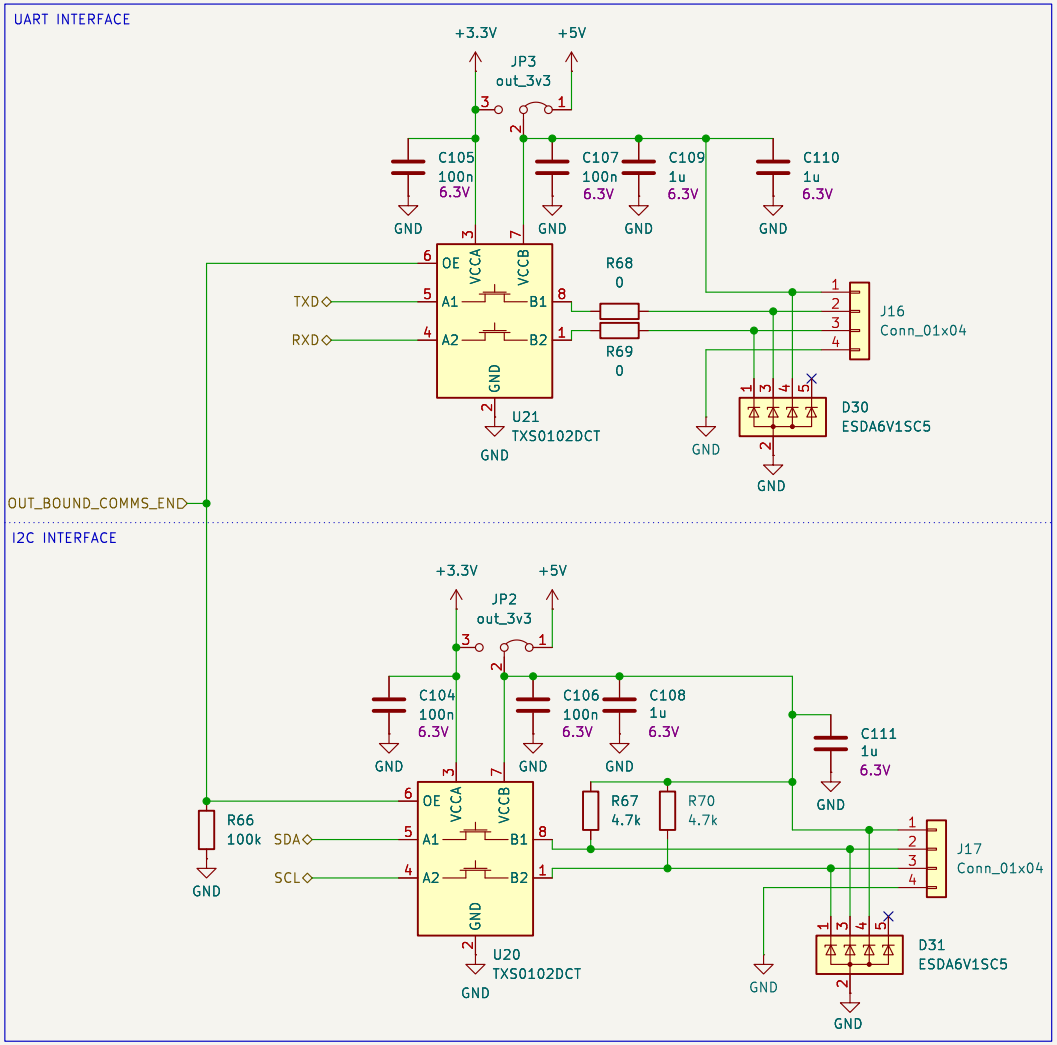

Component Class: MOTOR_DRIVER_IC_MOTOR_DRIVER1
MOTOR_DRIVER_FETS_MOTOR_DRIVER1
VREF should be 2V if shunt is 5mOhm and we want a 20A max.
PWR_IND
C72 1u 50V
C73 22u 25V
C74 150u 35v
CAN SEE UP TO 12V
C71 100n 16V
U10
VCP
CPH
CPL
VM
GND
DVDD
AVDD
VREF
GH1
SH1
GL1
GH2
SH2
GL2
SP
SN
SNSOUT
nFAULT
EN
PH
SO
nSLEEP
IDRIVE
TI DRV8701ERGER
NMOS Q5
NMOS Q6
NMOS Q7
NMOS Q8
M2 Motor
DRV_3V3
C68 1u 6.3V
C69 1u 6.3V
R42 47k
R43 33k
1v98
C70 1u 6.3V
ENABLED
PHASED
SENSEOUT
R46 33k
R44 180
R45 180
RED-Toby
D20
D21
R47 5m ±50ppm/C
IDrive dictates the current to the gate of mosfet, NC means 150ma source and 300ma sink.
Sheet: /MOTOR_DRIVER1/
File: MOTOR_DRIVER.kicad_sch
Title:
Size: A4
Date:
Rev:
KiCad E.D.A. 9.0.8
Id: 5/10


Component Class: MOTOR_DRIVER_IC_MOTOR_DRIVER3
MOTOR_DRIVER_FETS_MOTOR_DRIVER3
VREF should be 2V if shunt is 5mOhm and we want a 20A max.
PWR_IND
C79 1u 50V
C80 22u 25V
C81 150u 35v
CAN SEE UP TO 12V
C78 100n 16V
U11
VCP
CPH
CPL
VM
GND
DVDD
AVDD
VREF
GH1
SH1
GL1
NMOS Q9
NMOS Q10
NMOS Q11
NMOS Q12
M3 Motor
DRV_3V3
C75 1u 6.3V
C76 1u 6.3V
R48 47k
R49 33k
1v98
C77 1u 6.3V
ENABLED
PHASED
SENSEOUT
EN
PH
SO
GH2
SH2
GL2
R52 33k
nSLEEP
IDRIVE
SP
SN
R53 5m ±50ppm/C
RED-Toby
D22
D23
R50 180
R51 180
SNSOUT
nFAULT
TI DRV8701ERGER
IDrive dictates the current to the gate of mosfet, NC means 150ma source and 300ma sink.
Sheet: /MOTOR_DRIVER3/
File: MOTOR_DRIVER.kicad_sch
Title:
Size: A4
Date:
Rev:
KiCad E.D.A. 9.0.8
Id: 6/10


Component Class: MOTOR_DRIVER_IC_MOTOR_DRIVER4
MOTOR_DRIVER_FETS_MOTOR_DRIVER4
VREF should be 2V if shunt is 5mOhm and we want a 20A max.
PWR_IND
C86 1u 50V
C87 22u 25V
C88 150u 35v
CAN SEE UP TO 12V
C85 100n 16V
U12
VCP
CPH
CPL
VM
GND
DVDD
AVDD
VREF
GH1
SH1
GL1
NMOS Q13
NMOS Q14
NMOS Q15
NMOS Q16
M4 Motor
DRV_3V3
C82 1u 6.3V
C83 1u 6.3V
R54 47k
R55 33k
1v98
C84 1u 6.3V
ENABLED
PHASED
SENSEOUT
EN
PH
SO
GH2
SH2
GL2
R58 33k
nSLEEP
IDRIVE
SP
SN
R59 5m ±50ppm/C
RED-Toby
D24
D25
R56 180
R57 180
SNSOUT
nFAULT
TI DRV8701ERGER
IDrive dictates the current to the gate of mosfet, NC means 150ma source and 300ma sink.
Sheet: /MOTOR_DRIVER4/
File: MOTOR_DRIVER.kicad_sch
Title:
Size: A4
Date:
Rev:
KiCad E.D.A. 9.0.8
Id: 7/10


BATTERY POWER MONITOR
+3.3V
C91
100n
6.3V
C92
1u
6.3V
GND
BATT_SHUNT+
A1
A0
SDA
SCL
Alert
VS
Vbus
Vin+
Vin−
INA228
SHUNT LOCATED ON
POWER SCH
!PWR_ALERT
BATT_SHUNT−
ADDR: 1000000
U14
MOTOR DRIVER MOSFET TEMP MEASUREMENT SENSOR
C94
10n
6.3V
ADDR: 1001000
V+
ADD0
ADD1
U16
TMP100
POWER MUX TEMP SENSOR
C93
10n
6.3V
ADDR: 1001001
U17
TMP100
AMBIENT TEMP SENSOR
C96
10n
6.3V
ADDR: 1001110
R65
100k
U15
TMP100
MOTOR CURRENT SENSE AND TEMP MONITOR
C89
100n
6.3V
C90
1u
6.3V
ADDR: 1000111
OPERATION MODE : MODE_1
INT
VREF
IN0
IN1
IN2
IN3
IN4
IN5
IN6
IN7
MOTOR_DRIVER_1_I_SENSE
MOTOR_DRIVER_2_I_SENSE
MOTOR_DRIVER_3_I_SENSE
MOTOR_DRIVER_4_I_SENSE
R60
100k
R61
100k
R62
100k
R63
100k
R64
100k
U13
ADC128D818
THERMISTOR INPUTS
D26
ESDA6V1SC5
D27
ESDA6V1SC5
Conn_01x08
J8
C117
100n
6.3V
C118
100n
6.3V
U23
KXTJ3-1057
IO_VDD
VDD
INT
SCL
SDA
ADDR
RES
points to measure temp:
software controlled power switch
power mux
motor drivers
Sheet: /BOARD_STAT_MESUREMENT/
File: BOARD_STAT_MESUREMENT.kicad_sch
Title:
Size: A4
Date:
Rev:
KiCad E.D.A. 9.0.8
Id: 8/10




Sheet: /EXTERNAL_INTERFACING_DEVICES/
File: EXTERNAL_INTERFACING_DEVICES.kicad_sch

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| Size: A4 | Date: | **Rev:** |
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