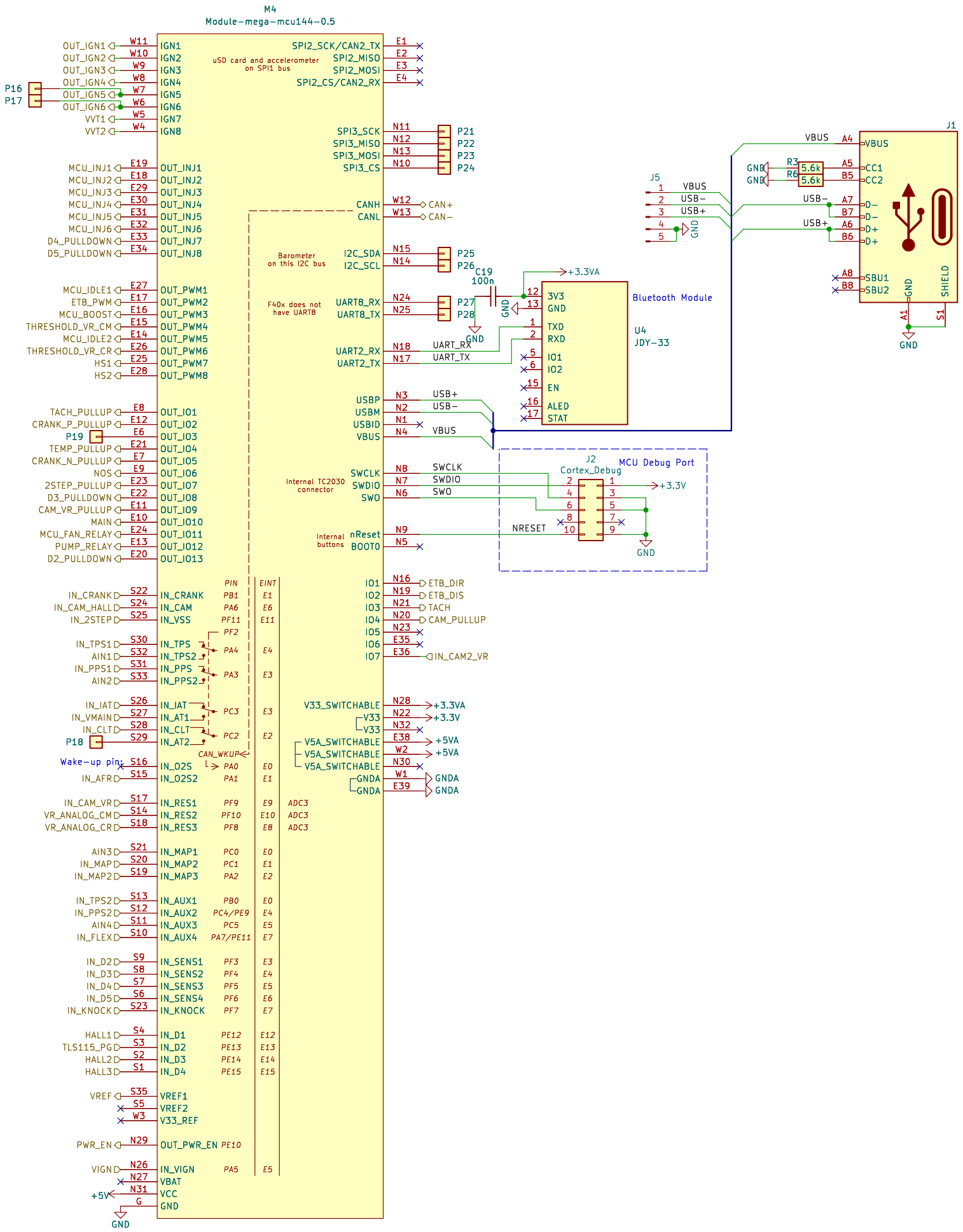
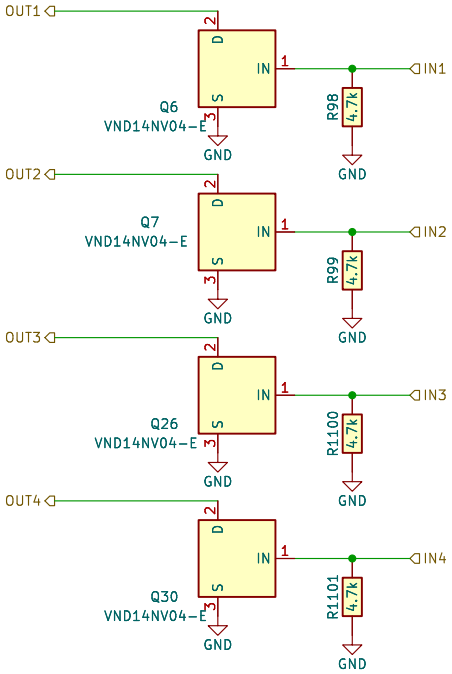
Bus types
General purpose bus
Ignition
Injection & LS-outputs
Analog inputs (sensors)
Discrete inputs

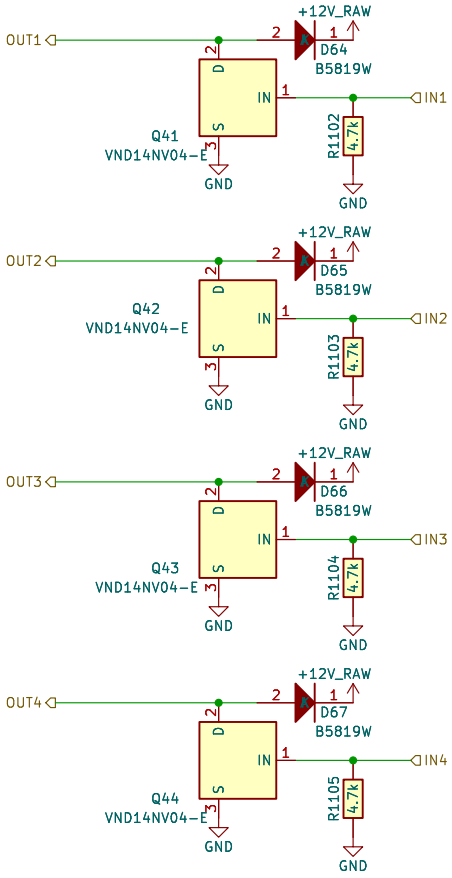
P1 BLACK
HCCPHPE24BKA90F
P2 GREY
HCCPHPE24BGYB90F
AUX
J6
430451012
Power
M1
Module-power_12and5V-0.2
Install R40 0 Ohm if you dont use TLS115
GND test pads
J3
J4
J7
J8
MCU
M2
Module-ign8-0.2
M6
Module-ign8-0.2
INJ
12A Low-side
(VND14)
LS1
LS2
HS
3A High-side
TACH_PULLUP
5V 750 Ohm (default)/12V 970 Ohm
LS_weak
5A Low-side
ETB
TLE9201 motor driver
HALL_OPT_PU
Float (default)/4.47k UP
Test note:
remove 1nf for VR
Test note:
IN_CRANK+ line
HALL: remove R753_2
VR: remove R1126, R22
M8
Module-vr-discrete-0.4
M3
Module-vr-discrete-0.4
OPT_PULLDOWNS1
4.5k UP (default)/3.3k DOWN
vr9924
M9
Module-knock-0.2
OPT_PULLUPS
Float (default)/2.7k UP
File: DOUBLE_PU.kicad_sch
Configurable AUX pulls
MAP
Internal MAP sensor
File: MCU.kicad_sch
LEDs
Board info
FOR OFF ROAD PURPOSES ONLY
This is not for applications with emissions or safety regulations (AKA not for street use). This is for closed stages, track and equipment.
http://www.alphaxpr.com/
Hellen-One-PCB-logo

rusEFI	
Sheet: /	
File: alphax_4ch.kicad_sch	
Title: AlphaECU 4chan powered by rusEFI	
Size: A2	Date: 2023-12-08
KiCad E.D.A. kicad-cli 7.0.11-7.0.11-ubuntu22.04.1	Rev: i Id: 1/14

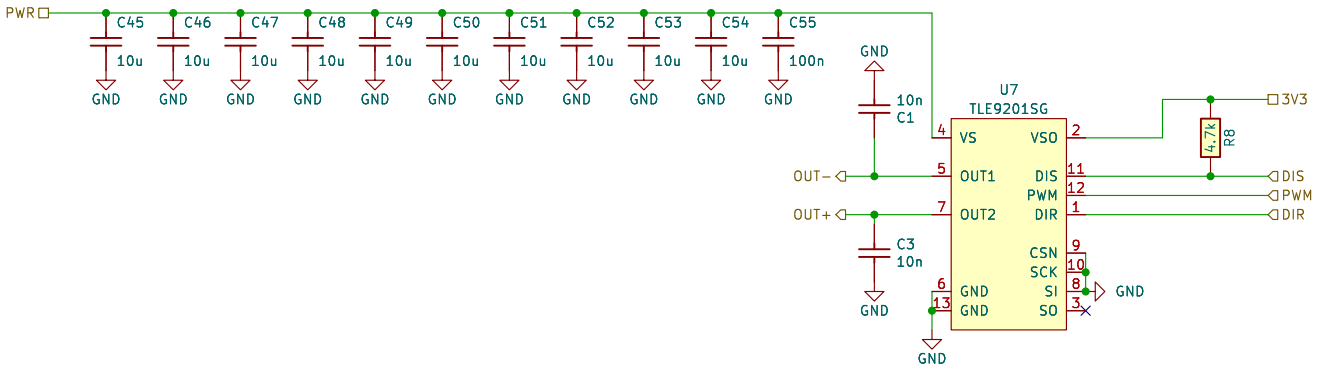

M4
Module-mega-mcu144-0.5
uSD card and accelerometer on SPI1 bus
Barometer on this I2C bus
F40x does not have UART8
Internal TC2030 connector
Internal buttons
Bluetooth Module
U4
JDY-33
J1
J2
Cortex_Debug
MCU Debug Port
J5
R3
R6
5.6k
C19
100n
+3.3VA
+3.3V
+5V
GND
VBUS
USB+
USB-
UART_RX
UART_TX
SWCLK
SWDIO
SWO
NRESET
SHIELD
OUT_IGN1
OUT_IGN2
OUT_IGN3
OUT_IGN4
OUT_IGN5
OUT_IGN6
VVT1
VVT2
SPI2_SCK/CAN2_TX
SPI2_MISO
SPI2_MOSI
SPI2_CS/CAN2_RX
SPI3_SCK
SPI3_MISO
SPI3_MOSI
SPI3_CS
CANH
CANL
I2C_SDA
I2C_SCL
UART8_RX
UART8_TX
UART2_RX
UART2_TX
USBP
USBM
USBID
VBUS
nReset
BOOT0
IO1
IO2
IO3
IO4
IO5
IO6
IO7
ETB_DIR
ETB_DIS
TACH
CAM_PULLUP
IN_CAM2_VR
V33_SWITCHABLE
V5A_SWITCHABLE
GNDA
OUT_INJ1
OUT_INJ2
OUT_INJ3
OUT_INJ4
OUT_INJ5
OUT_INJ6
OUT_INJ7
OUT_INJ8
OUT_PWM1
OUT_PWM2
OUT_PWM3
OUT_PWM4
OUT_PWM5
OUT_PWM6
OUT_PWM7
OUT_PWM8
OUT_IO1
OUT_IO2
OUT_IO3
OUT_IO4
OUT_IO5
OUT_IO6
OUT_IO7
OUT_IO8
OUT_IO9
OUT_IO10
OUT_IO11
OUT_IO12
OUT_IO13
OUT_PWR_EN
IN_CRANK
IN_CAM_HALL
IN_2STEP
IN_TPS1
AIN1
IN_PPS1
AIN2
IN_IAT
IN_VMAIN
IN_CLT
Wake-up pin
IN_AFR
IN_CAM_VR
VR_ANALOG_CM
VR_ANALOG_CR
AIN3
IN_MAP
IN_MAP2
IN_TPS2
IN_PPS2
AIN4
IN_FLEX
IN_D2
IN_D3
IN_D4
IN_D5
IN_KNOCK
HALL1
TLS115_PG
HALL2
HALL3
VREF
PWR_EN
VIGN
+5V
P16
P17
P18
P19
D4_PULLDOWN
D5_PULLDOWN
MCU_IDLE1
ETB_PWM
MCU_BOOST
THRESHOLD_VR_CM
MCU_IDLE2
THRESHOLD_VR_CR
HS1
HS2
TACH_PULLUP
CRANK_P_PULLUP
TEMP_PULLUP
CRANK_N_PULLUP
NOS
2STEP_PULLUP
D3_PULLDOWN
CAM_VR_PULLUP
MAIN
MCU_FAN_RELAY
PUMP_RELAY
D2_PULLDOWN
IGN1
IGN2
IGN3
IGN4
IGN5
IGN6
IGN7
IGN8
PIN
EINT
IN_CRANK PB1 E1
IN_CAM PA6 E6
IN_VSS PF11 E11
IN_TPS PF2
IN_TPS2 PA4 E4
IN_PPS PA3 E3
IN_IAT
IN_AT1 PC3 E3
IN_CLT
IN_AT2 PC2 E2
CAN_WKUP
IN_O2S PA0 E0
IN_O2S2 PA1 E1
IN_RES1 PF9 E9 ADC3
IN_RES2 PF10 E10 ADC3
IN_RES3 PF8 E8 ADC3
IN_MAP1 PC0 E0
IN_MAP2 PC1 E1
IN_MAP3 PA2 E2
IN_AUX1 PB0 E0
IN_AUX2 PC4/PE9 E4
IN_AUX3 PC5 E5
IN_AUX4 PA7/PE11 E7
IN_SENS1 PF3 E3
IN_SENS2 PF4 E4
IN_SENS3 PF5 E5
IN_SENS4 PF6 E6
IN_KNOCK PF7 E7
IN_D1 PE12 E12
IN_D2 PE13 E13
IN_D3 PE14 E14
IN_D4 PE15 E15
VREF1
VREF2
V33_REF
OUT_PWR_EN PE10
IN_VIGN PA5 E5
VBAT
VCC
GND
Sheet: /MCU/
File: MCU.kicad_sch
Title:
Size: A3
Date:
Rev:
KiCad E.D.A. kicad-cli 7.0.11-7.0.11~ubuntu22.04.1
Id: 2/14



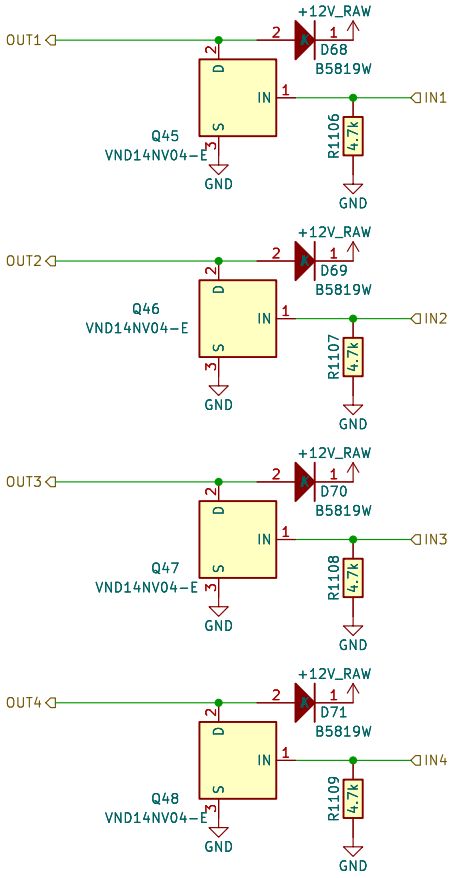
Sheet: /INJ/		
File: INJ4.kicad_sch		
Title:		
Size: A4	Date:	**Rev:**
KiCad E.D.A. kicad-cli 7.0.11-7.0.11~ubuntu22.04.1		Id: 3/14



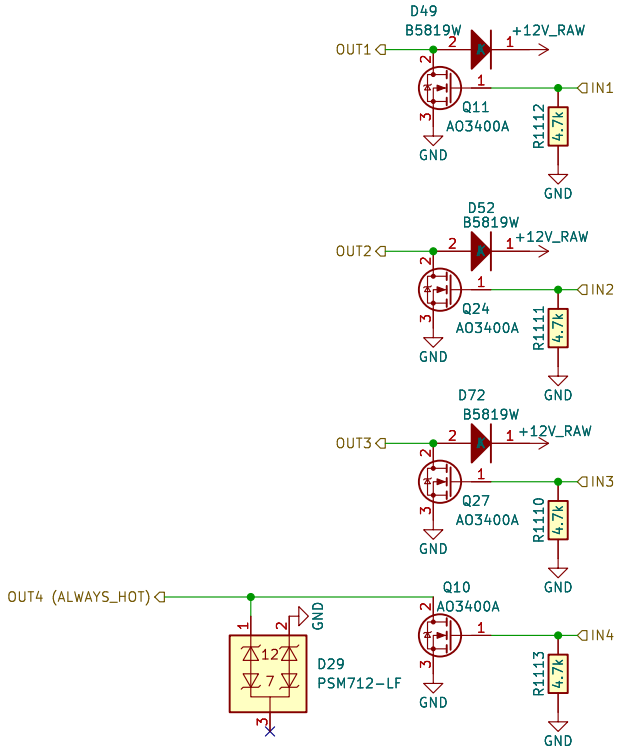
Sheet: /LS1/		
File: LS4.kicad_sch		
Title:		
Size: A4	Date:	**Rev:**
KiCad E.D.A. kicad-cli 7.0.11-7.0.11~ubuntu22.04.1		Id: 4/14



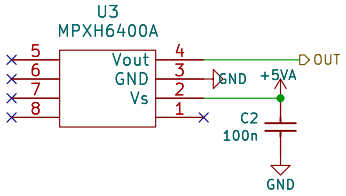
Sheet: /ETB/		
File: DC_MOTOR_0.1.kicad_sch		
Title: Hellen-One DC motor driver		
Size: A4	Date: 2023-09-04	**Rev: 0.1**
KiCad E.D.A. kicad-cli 7.0.11-7.0.11~ubuntu22.04.1		Id: 5/14



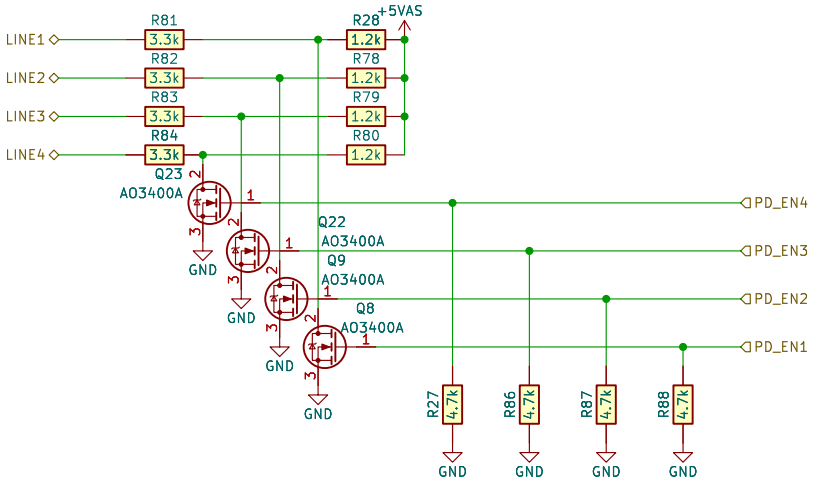
Sheet: /LS2/		
File: LS4.kicad_sch		
Title:		
Size: A4	Date:	**Rev:**
KiCad E.D.A. kicad-cli 7.0.11-7.0.11~ubuntu22.04.1		Id: 6/14



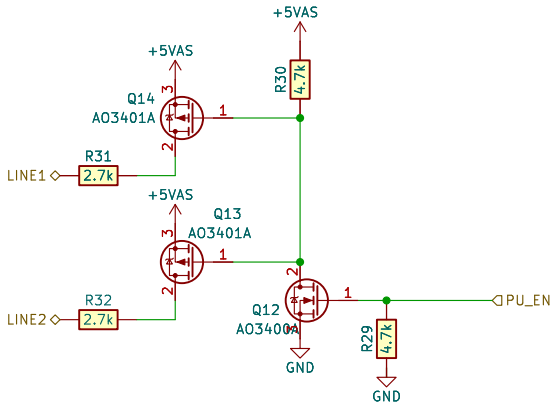
Sheet: /LS_weak/		
File: LS_weak.kicad_sch		
Title:		
Size: A4	Date:	**Rev:**
KiCad E.D.A. kicad-cli 7.0.11-7.0.11~ubuntu22.04.1		Id: 7/14



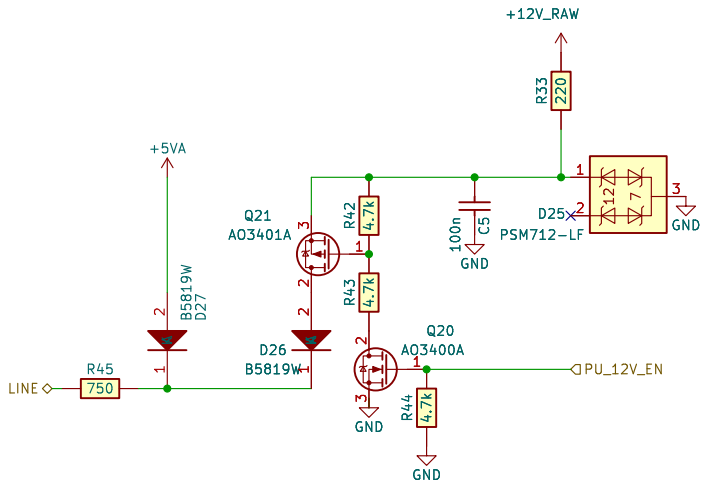
Sheet: /MAP/ File: MAP.kicad_sch		
Title:		
Size: A4	Date:	**Rev:**
KiCad E.D.A. kicad-cli 7.0.11-7.0.11~ubuntu22.04.1		Id: 8/14



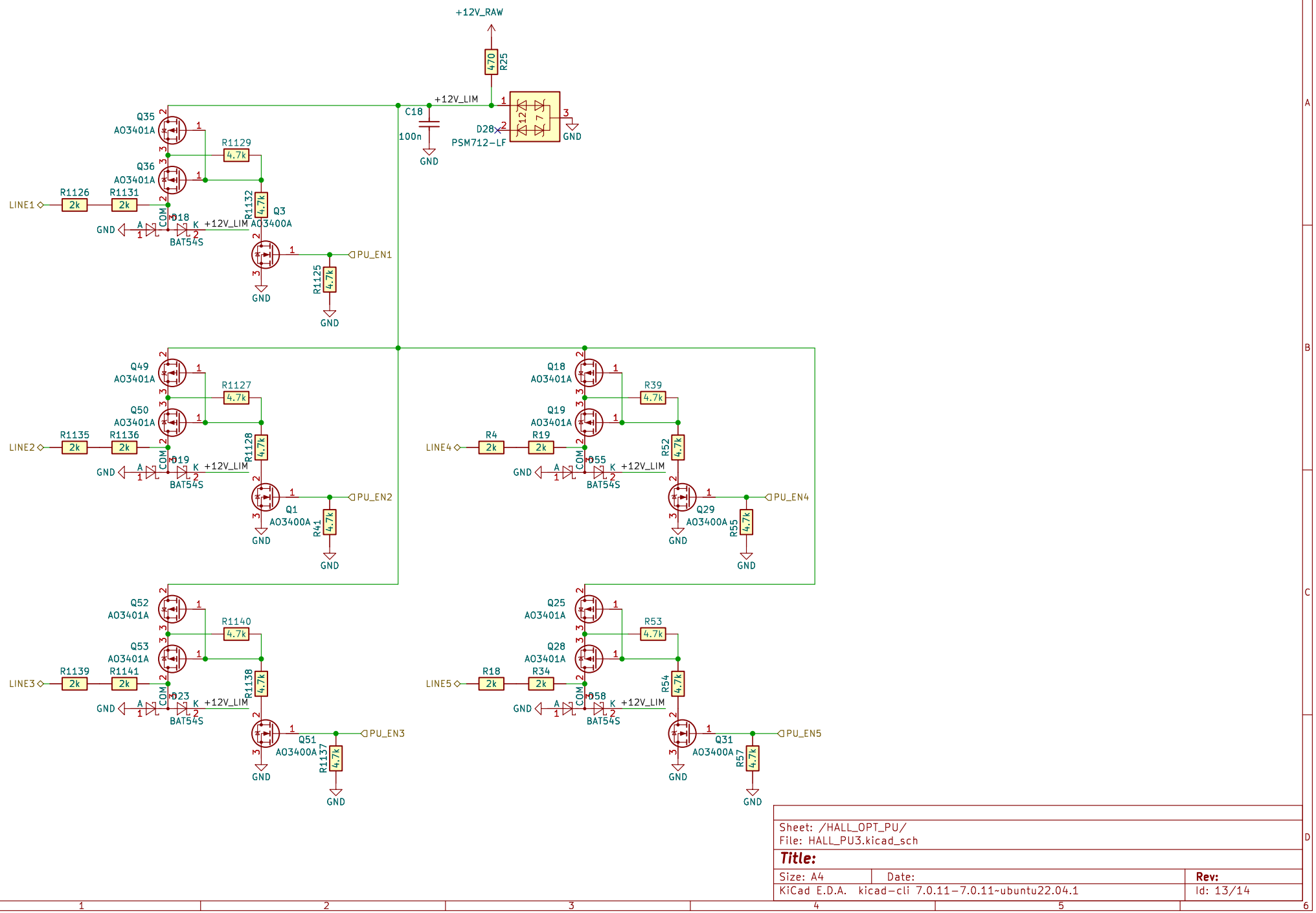
Sheet: /OPT_PULLDOWNS1/ File: PD4.kicad_sch		
Title:		
Size: A4	Date:	**Rev:**
KiCad E.D.A. kicad-cli 7.0.11-7.0.11~ubuntu22.04.1		Id: 9/14



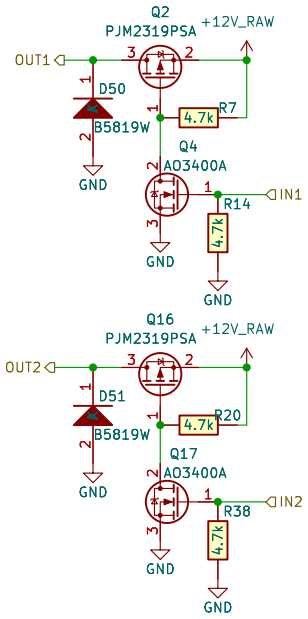
Sheet: /OPT_PULLUPS/ File: DOUBLE_PU.kicad_sch		
Title:		
Size: A4	Date:	**Rev:**
KiCad E.D.A. kicad-cli 7.0.11-7.0.11~ubuntu22.04.1		Id: 11/14



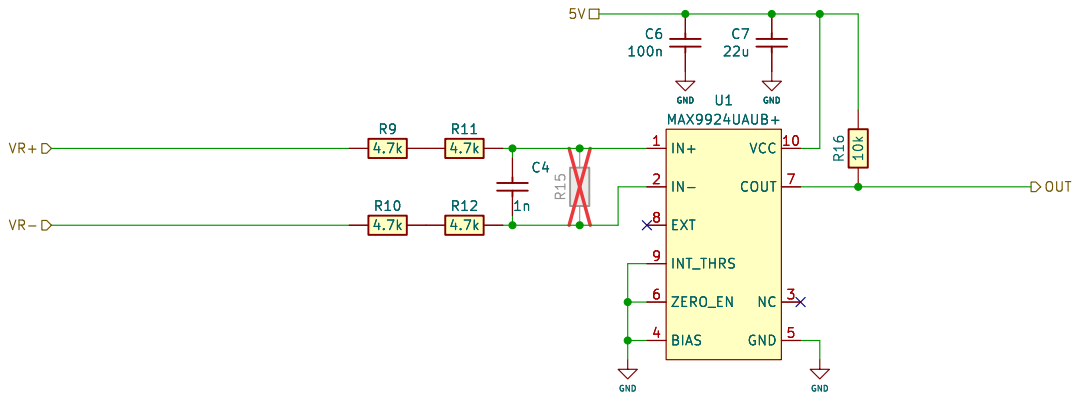
Sheet: /TACH_PULLUP/		
File: TACH_PU.kicad_sch		
Title:		
Size: A4	Date:	**Rev:**
KiCad E.D.A. kicad-cli 7.0.11-7.0.11~ubuntu22.04.1		Id: 12/14



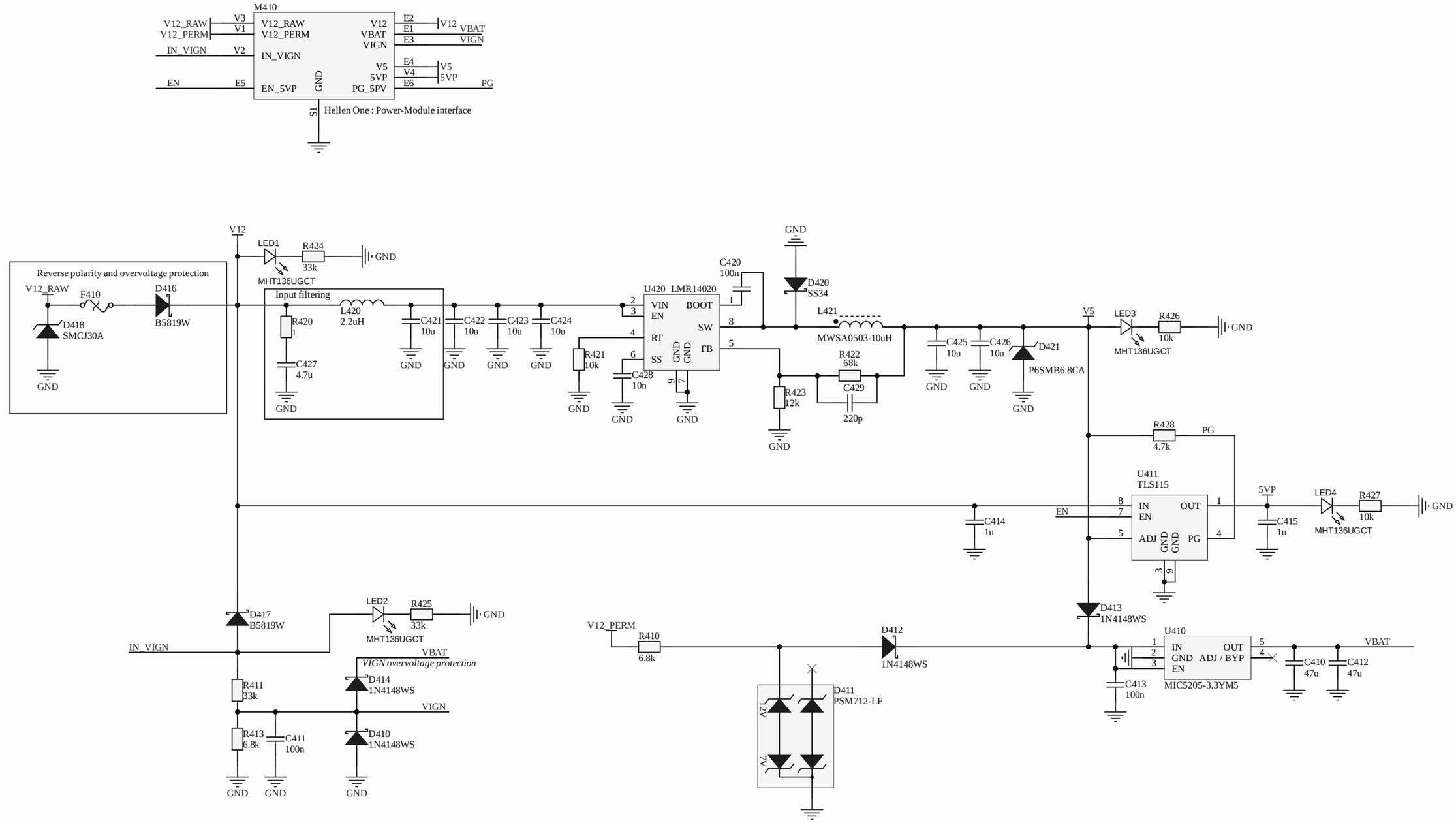
Sheet: /HALL_OPT_PU/	
File: HALL_PU3.kicad_sch	
Title:	
Size: A4	Date:
KiCad E.D.A. kicad-cli 7.0.11-7.0.11~ubuntu22.04.1	Rev: Id: 13/14



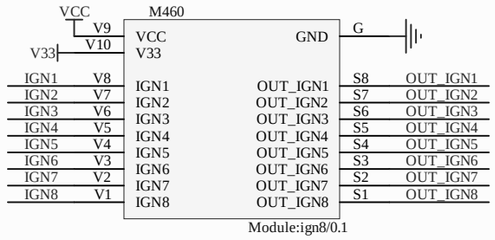
Sheet: /HS/ File: HS2.kicad_sch		
Title:		
Size: A4	Date:	**Rev:**
KiCad E.D.A. kicad-cli 7.0.11-7.0.11~ubuntu22.04.1		Id: 14/14

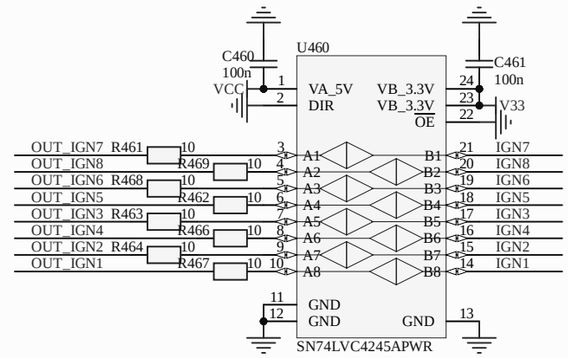


Sheet: /vr9924/		
File: vr9924.kicad_sch		
Title:		
Size: A4	Date:	**Rev:**
KiCad E.D.A. kicad-cli 7.0.11-7.0.11~ubuntu22.04.1		Id: 15/14

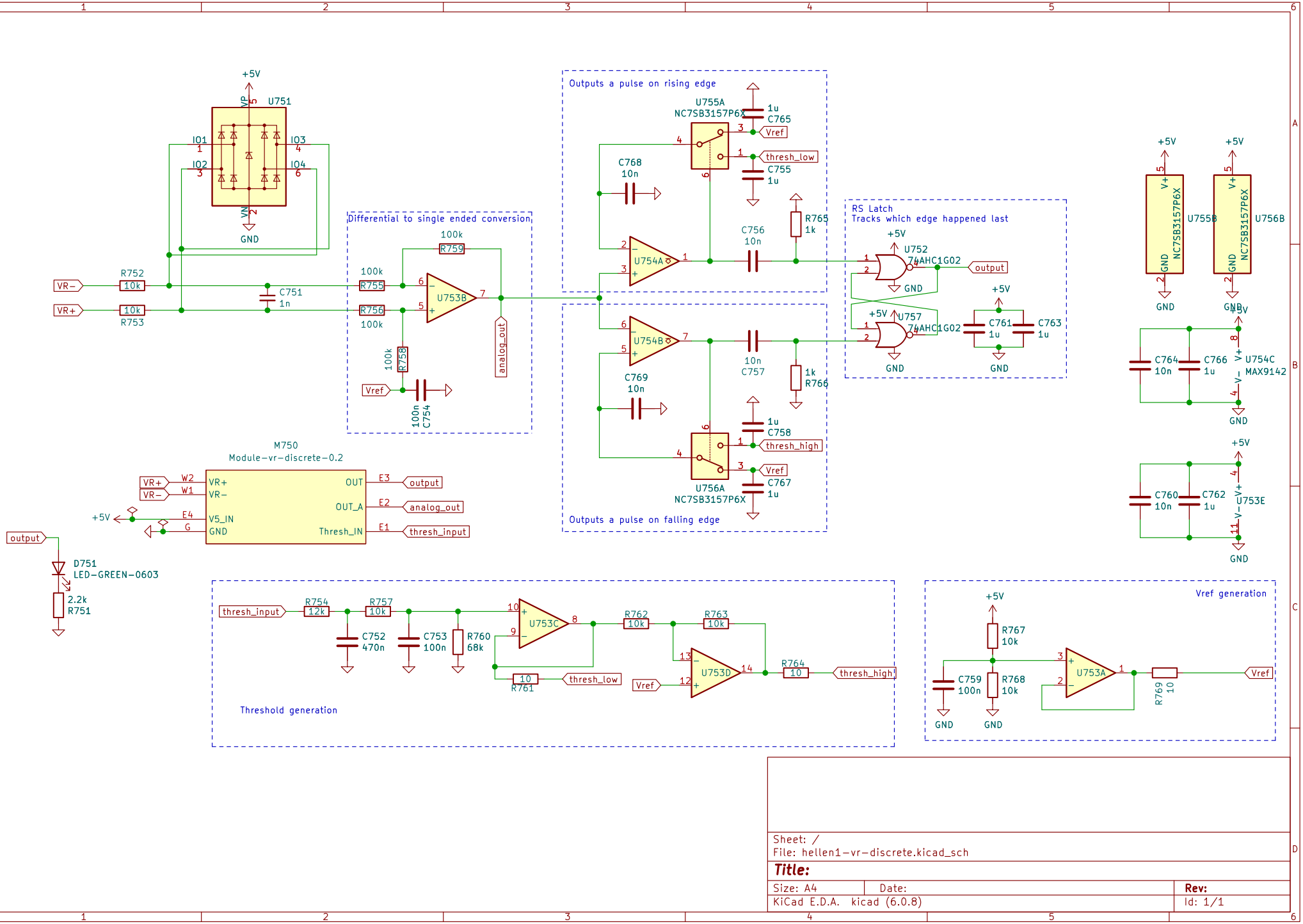


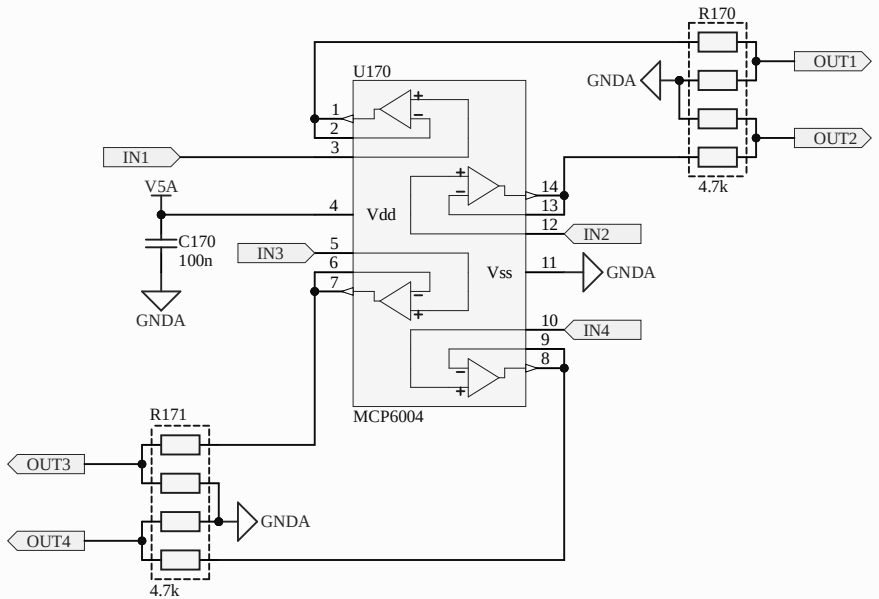
power_12and5V-0.2

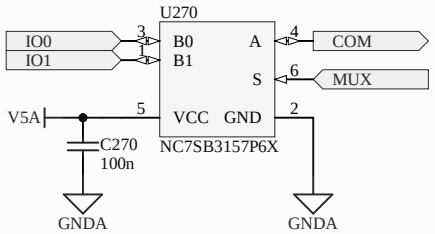


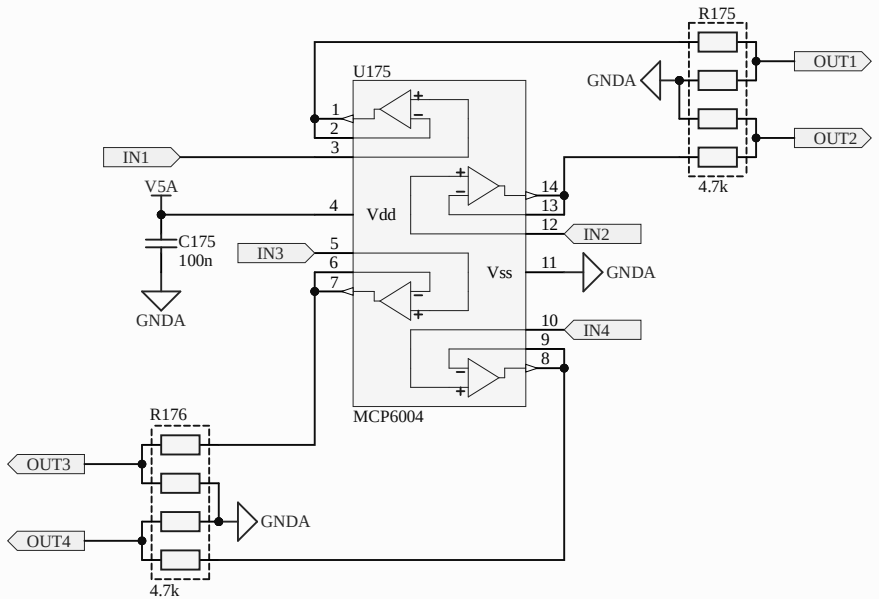


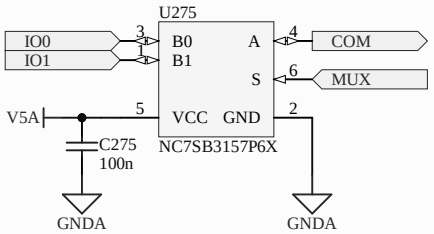
Title: ***Hellen-One IGN8***			***rusEFI EMS*** ***Hellen-One Platform*** *https://rusefi.com/s/hellen1/*
Size: A3	Author: andreika	Revision: 0.2	
Date: 18/03/2022		Sheet 1 of 1	

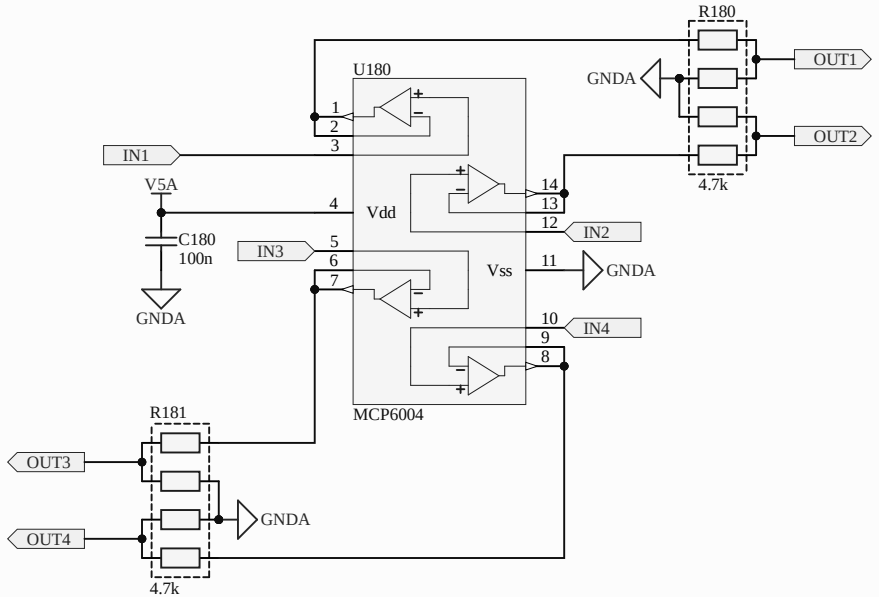

+5V
U751
IO1
IO2
IO3
IO4
VP
VN
GND
VR−
VR+
R752
10k
R753
10k
C751
1n
Differential to single ended conversion
100k
R759
100k
R755
100k
R756
U753B
analog_out
100k
R758
Vref
100n
C754
Outputs a pulse on rising edge
U755A
NC7SB3157P6X
1u
C765
Vref
thresh_low
C755
1u
C768
10n
U754A
C756
10n
R765
1k
RS Latch
Tracks which edge happened last
U752
74AHC1G02
output
U757
74AHC1G02
C761
1u
C763
1u
U754B
C769
10n
10n
C757
1k
R766
1u
C758
thresh_high
Vref
C767
1u
U756A
NC7SB3157P6X
Outputs a pulse on falling edge
U755B
U756B
C764
10n
C766
1u
U754C
MAX9142
C760
10n
C762
1u
U753E
M750
Module−vr−discrete−0.2
VR+
VR−
W2
W1
VR+
VR−
V5_IN
GND
OUT
OUT_A
Thresh_IN
E3
E2
E1
E4
G
output
analog_out
thresh_input
output
D751
LED−GREEN−0603
2.2k
R751
thresh_input
R754
12k
R757
10k
C752
470n
C753
100n
R760
68k
U753C
R762
10k
R763
10k
U753D
R764
10
thresh_high
10
R761
thresh_low
Vref
Threshold generation
Vref generation
R767
10k
C759
100n
R768
10k
U753A
R769
10
Vref
Sheet: /
File: hellen1−vr−discrete.kicad_sch
Title:
Size: A4
Date:
Rev:
KiCad E.D.A. kicad (6.0.8)
Id: 1/1

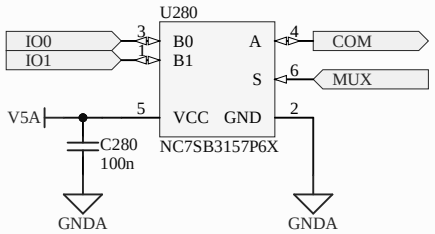

R170
U170
GNDA
OUT1
OUT2
1
2
3
IN1
V5A
4
Vdd
14
13
12
IN2
C170
100n
IN3
5
6
7
Vss
11
GNDA
GNDA
10
IN4
9
8
4.7k
MCP6004
R171
OUT3
OUT4
GNDA
4.7k

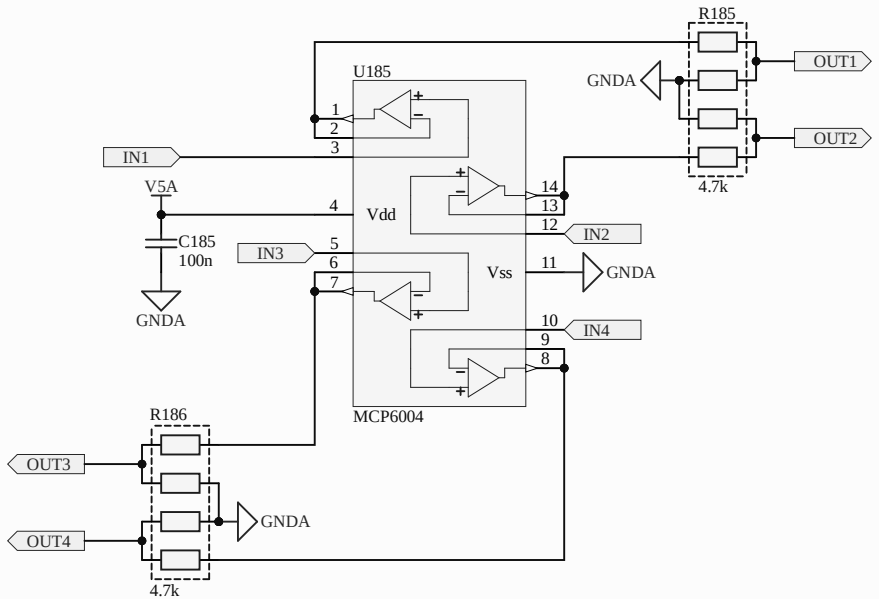

U270
IO0
IO1
3
1
B0
B1
A
S
4
6
COM
MUX
V5A
5
VCC
GND
2
C270
100n
NC7SB3157P6X
GNDA
GNDA

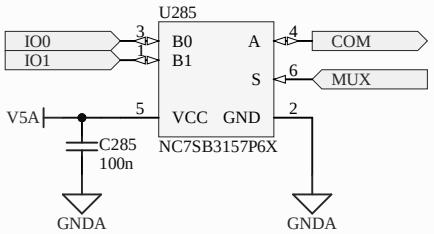

R175
U175
GNDA
OUT1
OUT2
1
2
3
IN1
V5A
4
Vdd
14
13
12
IN2
C175
100n
IN3
5
6
7
Vss
11
GNDA
GNDA
10
IN4
9
8
4.7k
MCP6004
R176
OUT3
OUT4
GNDA
4.7k

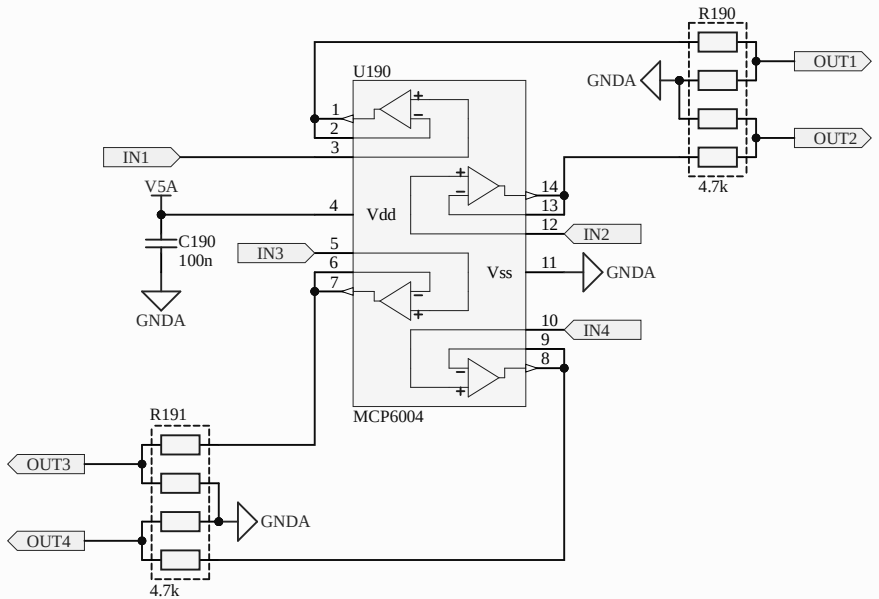

U275
IO0
IO1
3
1
B0
B1
A
S
4
6
COM
MUX
V5A
5
VCC
GND
2
C275
100n
NC7SB3157P6X
GNDA
GNDA

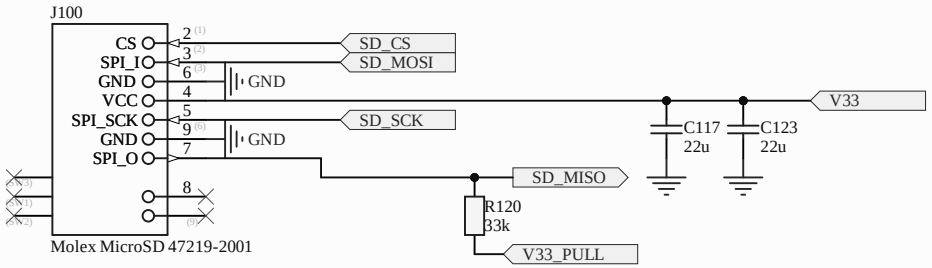

R180
U180
GNDA
OUT1
OUT2
IN1
V5A
Vdd
4.7k
C180
100n
IN3
Vss
IN2
GNDA
GNDA
IN4
MCP6004
R181
OUT3
GNDA
OUT4
4.7k

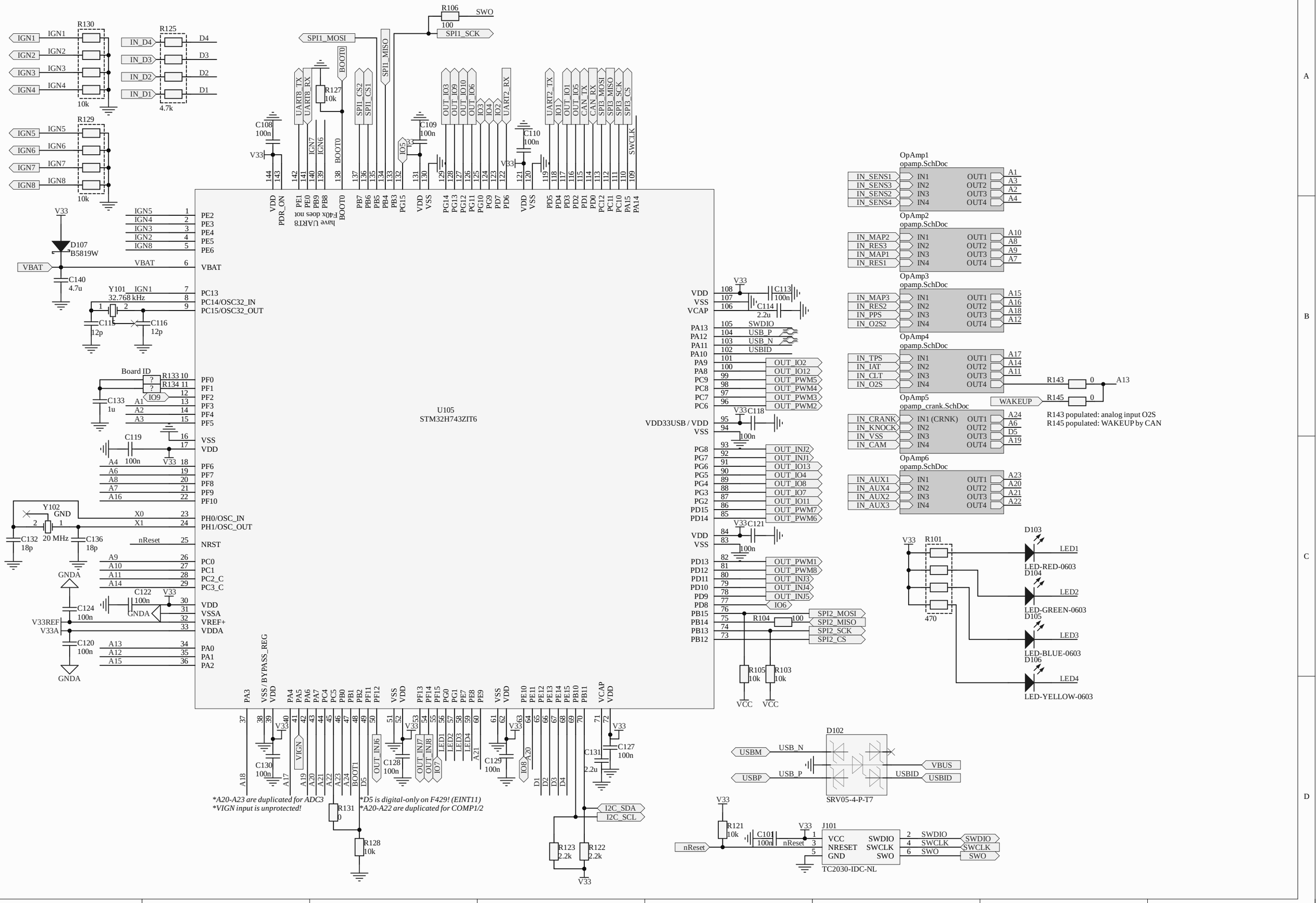

U280
IO0
IO1
3
1
B0
B1
A
S
4
6
COM
MUX
V5A
5
VCC
GND
2
C280
100n
NC7SB3157P6X
GNDA
GNDA

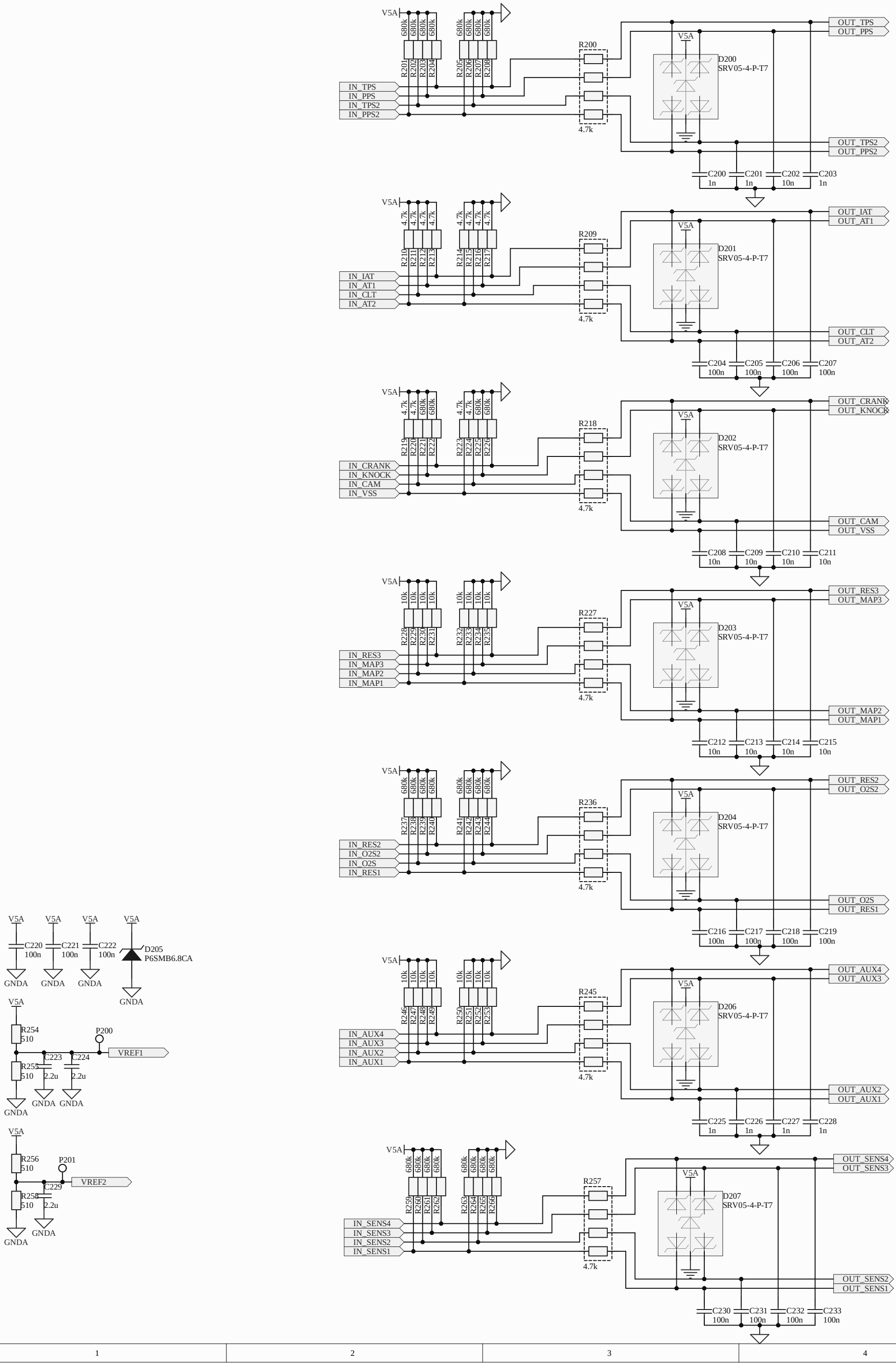

R185
U185
GNDA
OUT1
OUT2
IN1
V5A
Vdd
4.7k
C185
100n
IN3
Vss
IN2
GNDA
GNDA
IN4
MCP6004
R186
OUT3
GNDA
OUT4
4.7k

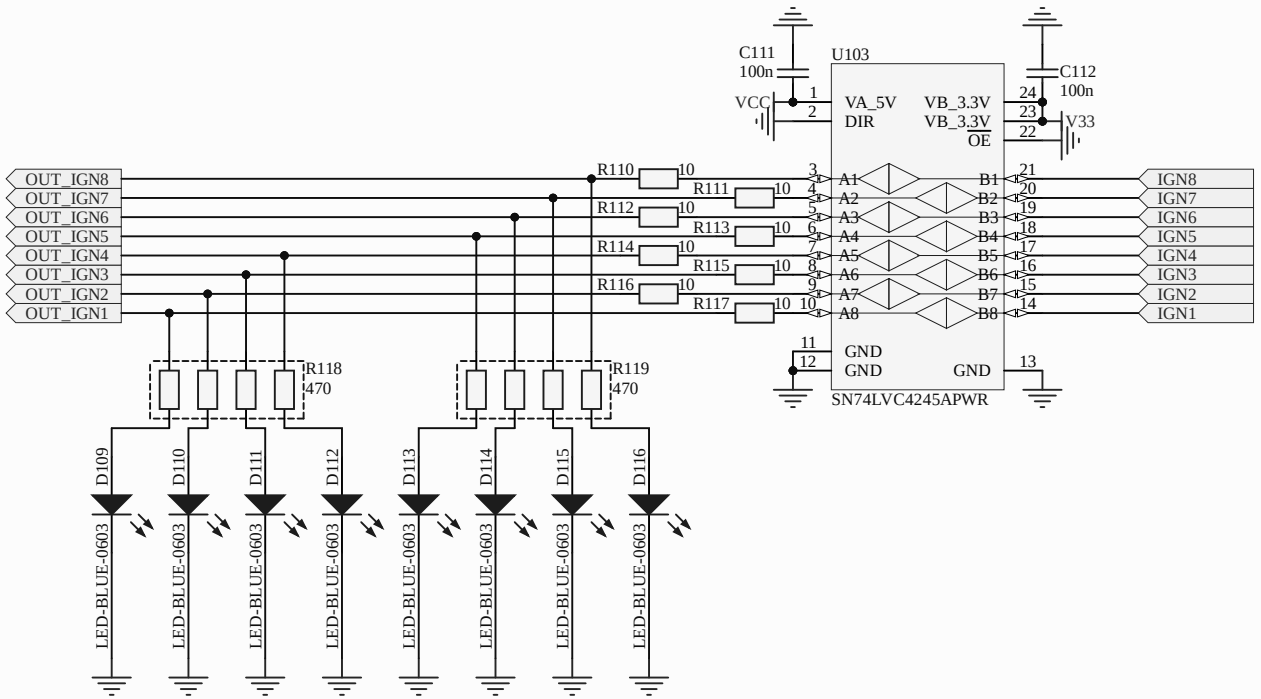

U285
IO0
IO1
3
B0
B1
A
4
COM
S
6
MUX
V5A
5
VCC
GND
2
C285
100n
NC7SB3157P6X
GNDA
GNDA

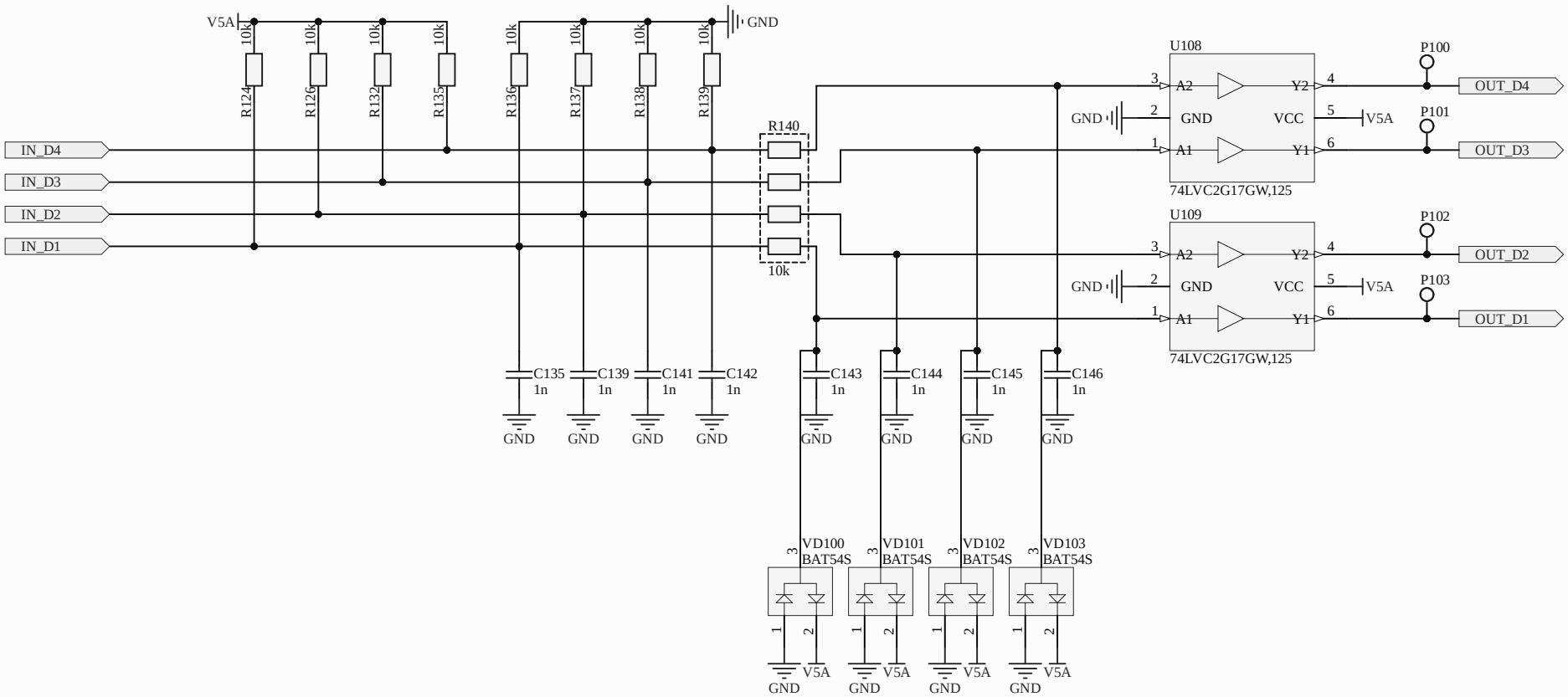

R190
U190
GNDA
OUT1
OUT2
IN1
V5A
Vdd
4.7k
C190
100n
IN3
IN2
Vss
GNDA
GNDA
IN4
MCP6004
R191
OUT3
GNDA
OUT4
4.7k

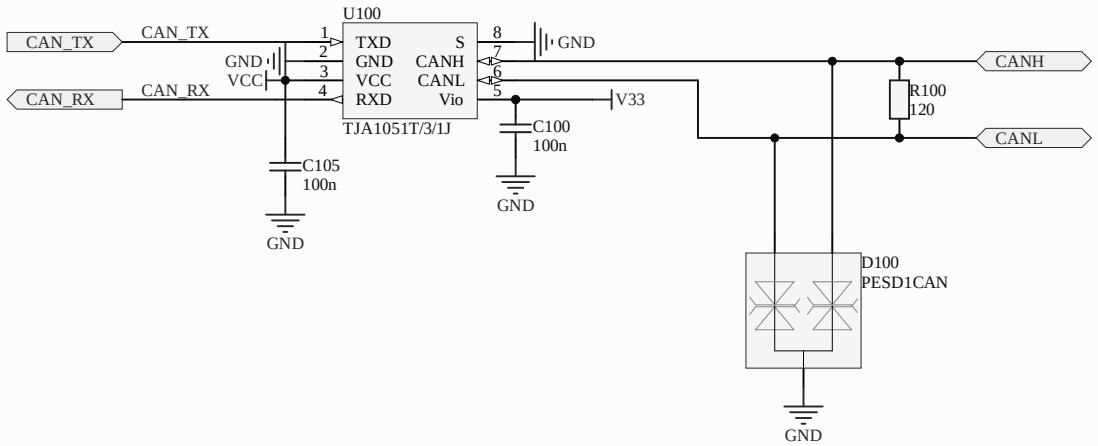

J100
CS
SPI_I
GND
VCC
SPI_SCK
GND
SPI_O
2
3
6
4
5
9
7
8
SD_CS
SD_MOSI
GND
SD_SCK
GND
SD_MISO
R120
33k
V33_PULL
V33
C117
22u
C123
22u
Molex MicroSD 47219-2001

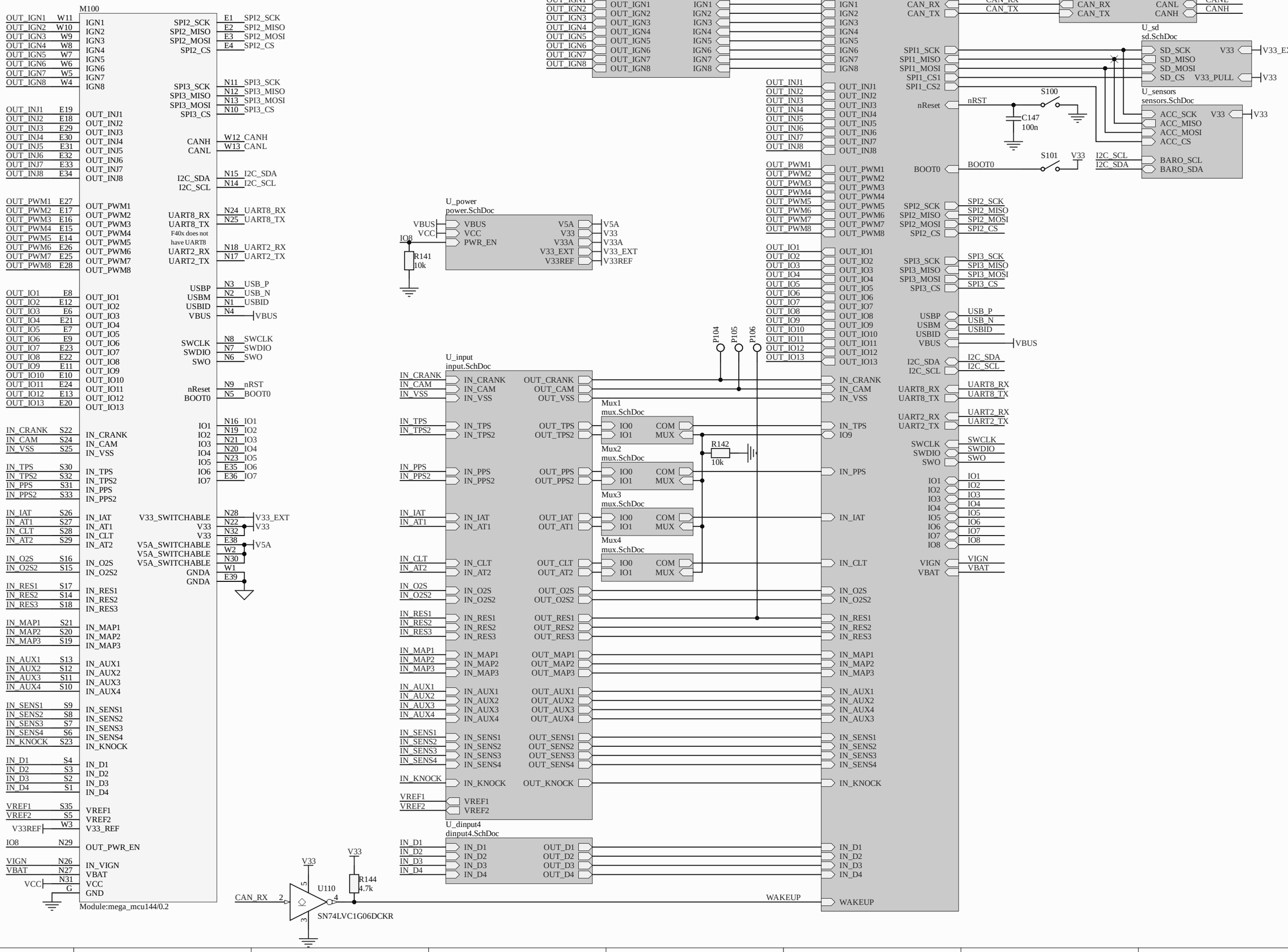

R130
R125
R129
IGN1
IGN2
IGN3
IGN4
IGN5
IGN6
IGN7
IGN8
IN_D4
IN_D3
IN_D2
IN_D1
D4
D3
D2
D1
10k
4.7k
R106
SWO
100
SPI1_SCK
SPI1_MOSI
SPI1_MISO
R127
10k
BOOT0
C108
100n
C109
100n
C110
100n
V33
UART8_TX
UART8_RX
SPI1_CS2
SPI1_CS1
OUT_IO3
OUT_IO9
OUT_IO10
OUT_IO6
IO3
IO4
IO2
UART2_RX
UART2_TX
IO1
OUT_IO1
OUT_IO5
CAN_TX
CAN_RX
SPI3_MOSI
SPI3_MISO
SPI3_SCK
SPI3_CS
SWCLK
VDD
PDR_ON
PE1
PE0
PB9
PB8
have UART8 F40x does not
BOOT0
PB7
PB6
PB5
PB4
PB3
PG15
VDD
VSS
PG14
PG13
PG12
PG11
PG10
PG9
PD7
PD6
VDD
VSS
PD5
PD4
PD3
PD2
PD1
PD0
PC12
PC11
PC10
PA15
PA14
D107
B5819W
VBAT
C140
4.7u
Y101
32.768 kHz
C115
12p
C116
12p
PE2
PE3
PE4
PE5
PE6
VBAT
PC13
PC14/OSC32_IN
PC15/OSC32_OUT
Board ID
R133
R134
IO9
C133
1u
PF0
PF1
PF2
PF3
PF4
PF5
C119
100n
VSS
VDD
PF6
PF7
PF8
PF9
PF10
Y102
GND
20 MHz
C132
18p
C136
18p
PH0/OSC_IN
PH1/OSC_OUT
nReset
NRST
GNDA
C124
100n
C122
100n
V33REF
V33A
C120
100n
PC0
PC1
PC2_C
PC3_C
VDD
VSSA
VREF+
VDDA
PA0
PA1
PA2
U105
STM32H743ZIT6
PA3
VSS/BYPASS_REG
VDD
PA4
PA5
PA6
PA7
PC4
PC5
PB0
PB1
PB2
PF11
PF12
VSS
VDD
PF13
PF14
PF15
PG0
PG1
PE7
PE8
PE9
VSS
VDD
PE10
PE11
PE12
PE13
PE14
PE15
PB10
PB11
VCAP
VDD
VIGN
OUT_IN6
OUT_IN7
OUT_IN8
IO7
LED1
LED2
LED3
LED4
A21
IO8
A20
BOOT1
D5
D1
D2
D3
D4
C130
100n
C128
100n
C129
100n
C131
2.2u
C127
100n
R131
0
R128
10k
R123
2.2k
R122
2.2k
I2C_SDA
I2C_SCL
*A20-A23 are duplicated for ADC3
*VIGN input is unprotected!
*D5 is digital-only on F429! (EINT11)
*A20-A22 are duplicated for COMP1/2
VDD
VSS
VCAP
C113
100n
C114
2.2u
PA13
PA12
PA11
PA10
PA9
PA8
PC9
PC8
PC7
PC6
SWDIO
USB_P
USB_N
USBID
OUT_IO2
OUT_IO12
OUT_PWM5
OUT_PWM4
OUT_PWM3
OUT_PWM2
VDD33USB / VDD
VSS
C118
100n
PG8
PG7
PG6
PG5
PG4
PG3
PG2
PD15
PD14
OUT_INJ2
OUT_INJ1
OUT_IO13
OUT_IO4
OUT_IO8
OUT_IO7
OUT_IO11
OUT_PWM7
OUT_PWM6
C121
100n
PD13
PD12
PD11
PD10
PD9
PD8
PB15
PB14
PB13
PB12
OUT_PWM1
OUT_PWM8
OUT_INJ3
OUT_INJ4
OUT_INJ5
IO6
SPI2_MOSI
SPI2_MISO
SPI2_SCK
SPI2_CS
R104
100
R105
10k
R103
10k
VCC
OpAmp1
opamp.SchDoc
IN_SENS1
IN_SENS3
IN_SENS2
IN_SENS4
IN1
IN2
IN3
IN4
OUT1
OUT2
OUT3
OUT4
A1
A3
A2
A4
OpAmp2
opamp.SchDoc
IN_MAP2
IN_RES3
IN_MAP1
IN_RES1
A10
A8
A9
A7
OpAmp3
opamp.SchDoc
IN_MAP3
IN_RES2
IN_PPS
IN_O2S2
A15
A16
A18
A12
OpAmp4
opamp.SchDoc
IN_TPS
IN_IAT
IN_CLT
IN_O2S
A17
A14
A11
R143
0
A13
WAKEUP
R145
0
OpAmp5
opamp_crank.SchDoc
IN_CRANK
IN_KNOCK
IN_VSS
IN_CAM
IN1 (CRNK)
A24
A6
D5
A19
R143 populated: analog input O2S
R145 populated: WAKEUP by CAN
OpAmp6
opamp.SchDoc
IN_AUX1
IN_AUX4
IN_AUX2
IN_AUX3
A23
A20
A21
A22
D103
LED1
LED-RED-0603
D104
LED2
LED-GREEN-0603
D105
LED3
LED-BLUE-0603
D106
LED4
LED-YELLOW-0603
R101
470
D102
USBM
USBP
VBUS
SRV05-4-P-T7
R121
10k
C101
100n
J101
VCC
NRESET
GND
SWDIO
SWCLK
SWO
TC2030-IDC-NL


V5A
680k
R201
R202
R203
R204
R205
R206
R207
R208
IN_TPS
IN_PPS
IN_TPS2
IN_PPS2
R200
4.7k
D200
SRV05-4-P-T7
OUT_TPS
OUT_PPS
OUT_TPS2
OUT_PPS2
C200 1n
C201 1n
C202 10n
C203 1n
4.7k
R210
R211
R212
R213
R214
R215
R216
R217
IN_IAT
IN_AT1
IN_CLT
IN_AT2
R209
D201
OUT_IAT
OUT_AT1
OUT_CLT
OUT_AT2
C204 100n
C205 100n
C206 100n
C207 100n
R219
R220
R221
R222
R223
R224
R225
R226
IN_CRANK
IN_KNOCK
IN_CAM
IN_VSS
R218
D202
OUT_CRANK
OUT_KNOCK
OUT_CAM
OUT_VSS
C208 10n
C209 10n
C210 10n
C211 10n
10k
R228
R229
R230
R231
R232
R233
R234
R235
IN_RES3
IN_MAP3
IN_MAP2
IN_MAP1
R227
D203
OUT_RES3
OUT_MAP3
OUT_MAP2
OUT_MAP1
C212 10n
C213 10n
C214 10n
C215 10n
R237
R238
R239
R240
R241
R242
R243
R244
IN_RES2
IN_O2S2
IN_O2S
IN_RES1
R236
D204
OUT_RES2
OUT_O2S2
OUT_O2S
OUT_RES1
C216 100n
C217 100n
C218 100n
C219 100n
R246
R247
R248
R249
R250
R251
R252
R253
IN_AUX4
IN_AUX3
IN_AUX2
IN_AUX1
R245
D206
OUT_AUX4
OUT_AUX3
OUT_AUX2
OUT_AUX1
C225 1n
C226 1n
C227 1n
C228 1n
R259
R260
R261
R262
R263
R264
R265
R266
IN_SENS4
IN_SENS3
IN_SENS2
IN_SENS1
R257
D207
OUT_SENS4
OUT_SENS3
OUT_SENS2
OUT_SENS1
C230 100n
C231 100n
C232 100n
C233 100n
C220 100n
C221 100n
C222 100n
D205
P6SMB6.8CA
GNDA
R254 510
R255 510
P200
VREF1
C223
C224
2.2u
R256 510
R258 510
P201
VREF2
C229

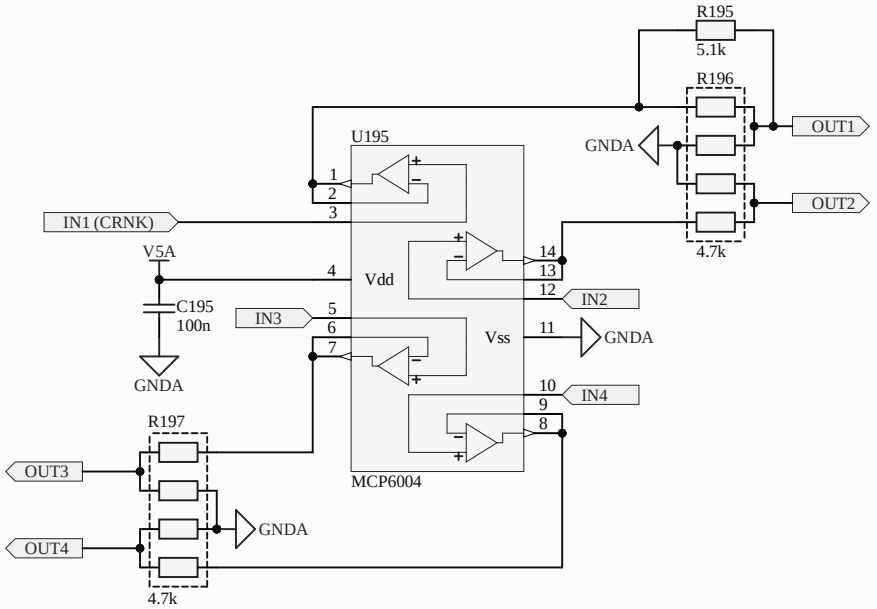

C111
100n
U103
C112
100n
VCC
VA_5V
VB_3.3V
DIR
VB_3.3V
OE
V33
GND
GND
GND
SN74LVC4245APWR
OUT_IGN8
OUT_IGN7
OUT_IGN6
OUT_IGN5
OUT_IGN4
OUT_IGN3
OUT_IGN2
OUT_IGN1
IGN8
IGN7
IGN6
IGN5
IGN4
IGN3
IGN2
IGN1
R110
R111
R112
R113
R114
R115
R116
R117
R118
470
R119
470
D109
D110
D111
D112
D113
D114
D115
D116
LED-BLUE-0603

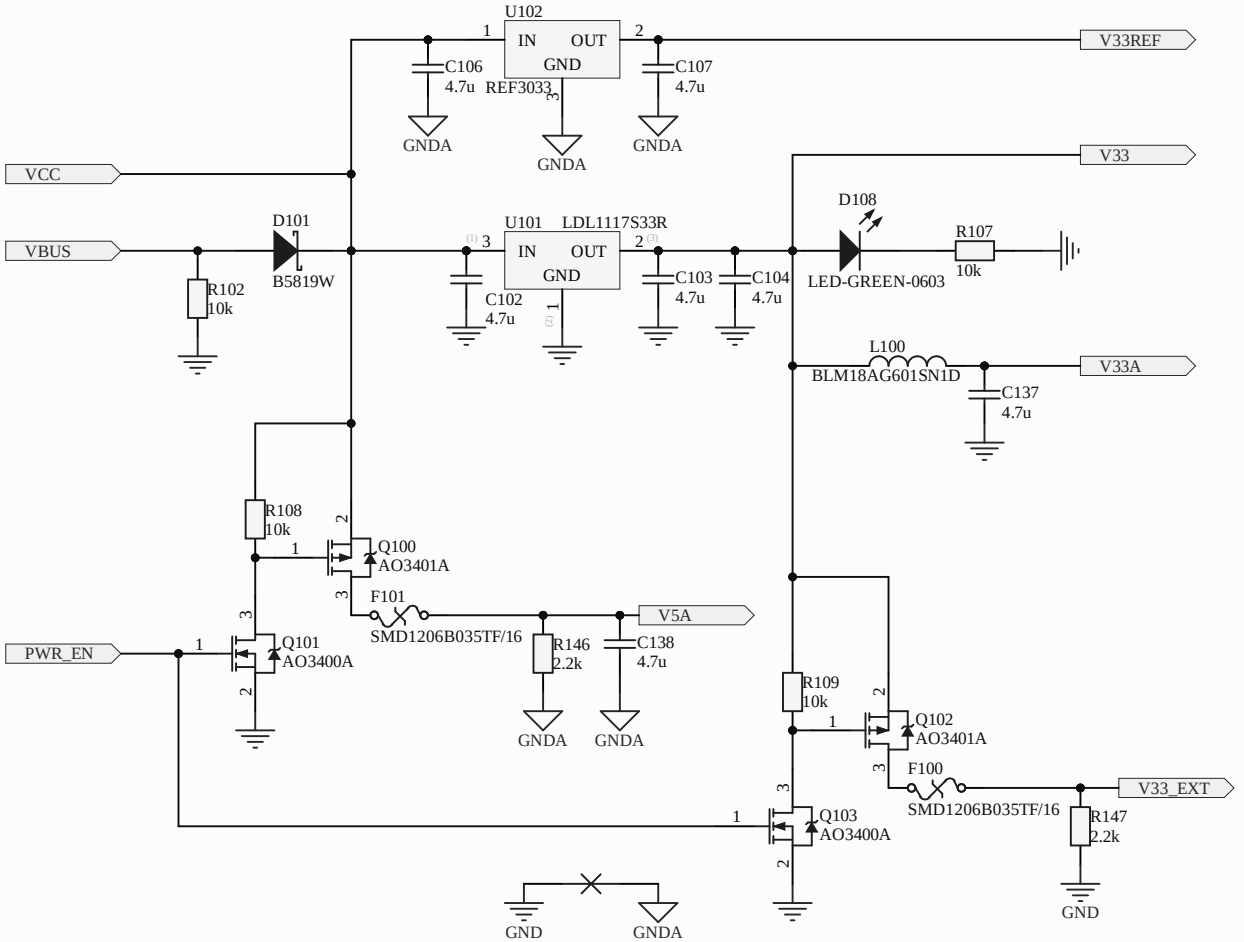

V5A
10k
R124
R126
R132
R135
R136
R137
R138
R139
GND
IN_D4
IN_D3
IN_D2
IN_D1
R140
10k
C135 1n
C139 1n
C141 1n
C142 1n
C143 1n
C144 1n
C145 1n
C146 1n
U108
A2
GND
A1
Y2
VCC
Y1
74LVC2G17GW,125
U109
74LVC2G17GW,125
P100
P101
P102
P103
OUT_D4
OUT_D3
OUT_D2
OUT_D1
VD100 BAT54S
VD101 BAT54S
VD102 BAT54S
VD103 BAT54S


U100
CAN_TX
CAN_TX
CAN_RX
CAN_RX
GND
VCC
1
2
3
4
TXD
GND
VCC
RXD
S
CANH
CANL
Vio
8
7
6
5
GND
V33
TJA1051T/3/1J
C105
100n
C100
100n
GND
GND
R100
120
CANH
CANL
D100
PESD1CAN
GND

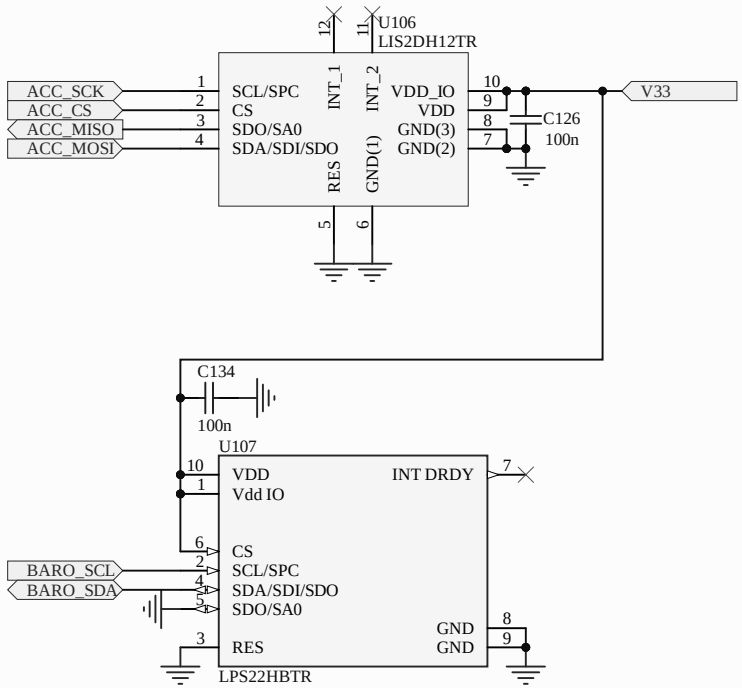

M100
OUT_IGN1 W11
OUT_IGN2 W10
OUT_IGN3 W9
OUT_IGN4 W8
OUT_IGN5 W7
OUT_IGN6 W6
OUT_IGN7 W5
OUT_IGN8 W4
IGN1
IGN2
IGN3
IGN4
IGN5
IGN6
IGN7
IGN8
SPI2_SCK E1 SPI2_SCK
SPI2_MISO E2 SPI2_MISO
SPI2_MOSI E3 SPI2_MOSI
SPI2_CS E4 SPI2_CS
SPI3_SCK N11 SPI3_SCK
SPI3_MISO N12 SPI3_MISO
SPI3_MOSI N13 SPI3_MOSI
SPI3_CS N10 SPI3_CS
OUT_INJ1 E19
OUT_INJ2 E18
OUT_INJ3 E29
OUT_INJ4 E30
OUT_INJ5 E31
OUT_INJ6 E32
OUT_INJ7 E33
OUT_INJ8 E34
CANH W12 CANH
CANL W13 CANL
I2C_SDA N15 I2C_SDA
I2C_SCL N14 I2C_SCL
OUT_PWM1 E27
OUT_PWM2 E17
OUT_PWM3 E16
OUT_PWM4 E15
OUT_PWM5 E14
OUT_PWM6 E26
OUT_PWM7 E25
OUT_PWM8 E28
UART8_RX N24 UART8_RX
UART8_TX N25 UART8_TX
F40x does not have UART8
UART2_RX N18 UART2_RX
UART2_TX N17 UART2_TX
OUT_IO1 E8
OUT_IO2 E12
OUT_IO3 E6
OUT_IO4 E21
OUT_IO5 E7
OUT_IO6 E9
OUT_IO7 E23
OUT_IO8 E22
OUT_IO9 E11
OUT_IO10 E10
OUT_IO11 E24
OUT_IO12 E13
OUT_IO13 E20
USBP N3 USB_P
USBM N2 USB_N
USBID N1 USBID
VBUS N4 VBUS
SWCLK N8 SWCLK
SWDIO N7 SWDIO
SWO N6 SWO
nReset N9 nRST
BOOT0 N5 BOOT0
IO1 N16 IO1
IO2 N19 IO2
IO3 N21 IO3
IO4 N20 IO4
IO5 N23 IO5
IO6 E35 IO6
IO7 E36 IO7
IN_CRANK S22
IN_CAM S24
IN_VSS S25
IN_TPS S30
IN_TPS2 S32
IN_PPS S31
IN_PPS2 S33
IN_IAT S26
IN_AT1 S27
IN_CLT S28
IN_AT2 S29
IN_O2S S16
IN_O2S2 S15
IN_RES1 S17
IN_RES2 S14
IN_RES3 S18
IN_MAP1 S21
IN_MAP2 S20
IN_MAP3 S19
IN_AUX1 S13
IN_AUX2 S12
IN_AUX3 S11
IN_AUX4 S10
IN_SENS1 S9
IN_SENS2 S8
IN_SENS3 S7
IN_SENS4 S6
IN_KNOCK S23
IN_D1 S4
IN_D2 S3
IN_D3 S2
IN_D4 S1
VREF1 S35
VREF2 S5
V33REF W3
IO8 N29
VIGN N26
VBAT N27
VCC N31
GND G
V33_SWITCHABLE N28 V33_EXT
V33 N22 V33
V33 N32
V33 E38
V5A_SWITCHABLE W2 V5A
V5A_SWITCHABLE N30
GNDA W1
GNDA E39
IN_CRANK
IN_CAM
IN_VSS
IN_TPS
IN_TPS2
IN_PPS
IN_PPS2
IN_IAT
IN_AT1
IN_CLT
IN_AT2
IN_O2S
IN_O2S2
IN_RES1
IN_RES2
IN_RES3
IN_MAP1
IN_MAP2
IN_MAP3
IN_AUX1
IN_AUX2
IN_AUX3
IN_AUX4
IN_SENS1
IN_SENS2
IN_SENS3
IN_SENS4
IN_KNOCK
IN_D1
IN_D2
IN_D3
IN_D4
VREF1
VREF2
V33_REF
OUT_PWR_EN
IN_VIGN
VBAT
VCC
GND
Module:mega_mcu144/0.2
U_ign8
ign8.SchDoc
OUT_IGN1
OUT_IGN2
OUT_IGN3
OUT_IGN4
OUT_IGN5
OUT_IGN6
OUT_IGN7
OUT_IGN8
IGN1
IGN2
IGN3
IGN4
IGN5
IGN6
IGN7
IGN8
U_mcu
mcu.SchDoc
U_can
can.SchDoc
CAN_RX
CAN_TX
CANL
CANH
U_sd
sd.SchDoc
SPI1_SCK
SPI1_MISO
SPI1_MOSI
SPI1_CS1
SPI1_CS2
SD_SCK
SD_MISO
SD_MOSI
SD_CS
V33_PULL
V33
V33_EXT
U_sensors
sensors.SchDoc
ACC_SCK
ACC_MISO
ACC_MOSI
ACC_CS
BARO_SCL
BARO_SDA
I2C_SCL
I2C_SDA
nReset
nRST
S100
C147
100n
BOOT0
S101
U_power
power.SchDoc
VBUS
VCC
PWR_EN
V5A
V33
V33A
V33_EXT
V33REF
IO8
R141
10k
P104
P105
P106
U_input
input.SchDoc
OUT_CRANK
OUT_CAM
OUT_VSS
OUT_TPS
OUT_TPS2
OUT_PPS
OUT_PPS2
OUT_IAT
OUT_AT1
OUT_CLT
OUT_AT2
OUT_O2S
OUT_O2S2
OUT_RES1
OUT_RES2
OUT_RES3
OUT_MAP1
OUT_MAP2
OUT_MAP3
OUT_AUX1
OUT_AUX2
OUT_AUX3
OUT_AUX4
OUT_SENS1
OUT_SENS2
OUT_SENS3
OUT_SENS4
OUT_KNOCK
VREF1
VREF2
Mux1
mux.SchDoc
Mux2
mux.SchDoc
Mux3
mux.SchDoc
Mux4
mux.SchDoc
IO0
IO1
COM
MUX
R142
10k
U_dinput4
dinput4.SchDoc
IN_D1
IN_D2
IN_D3
IN_D4
OUT_D1
OUT_D2
OUT_D3
OUT_D4
V33
R144
4.7k
U110
SN74LVC1G06DCKR
CAN_RX
WAKEUP
IO9
VIGN
VBAT

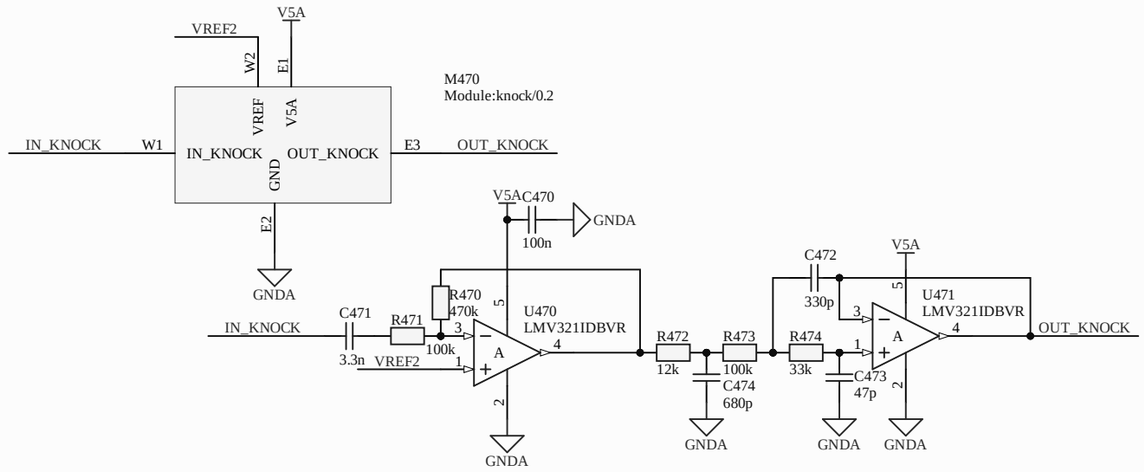
More accurate threshold for "raw" connection of VR sensors





Title		
Size A4	Number	Revision
Date: 11.26.2023		Sheet of
File: C:\github\..\power.SchDoc		Drawn By:


U106
LIS2DH12TR
ACC_SCK
ACC_CS
ACC_MISO
ACC_MOSI
SCL/SPC
CS
SDO/SA0
SDA/SDI/SDO
INT_1
INT_2
RES
GND(1)
VDD_IO
VDD
GND(3)
GND(2)
C126
100n
V33
C134
100n
U107
VDD
Vdd IO
INT DRDY
CS
SCL/SPC
SDA/SDI/SDO
SDO/SA0
RES
GND
GND
BARO_SCL
BARO_SDA
LPS22HBTR



Title: ***Hellen-One Knock***			***rusEFI EMS*** ***Hellen-One Platform*** *https://rusefi.com/s/hellen72*
Size: A3	Author: andreika	Revision: 0.2	
Date: 15.02.2023		Sheet 1 of 1	