MCU

File: mcu.kicad_sch

Sensors

File: sensors.kicad_sch

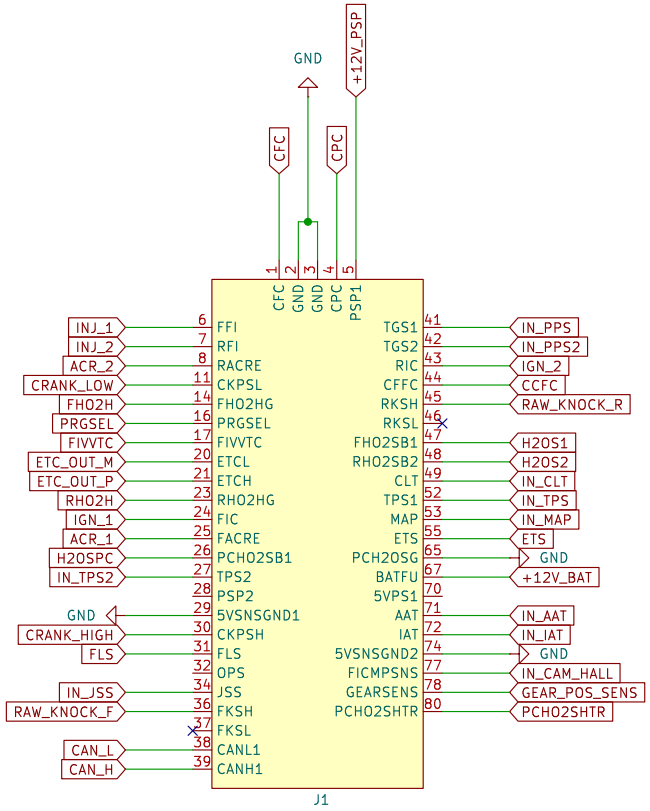
Bluetooth

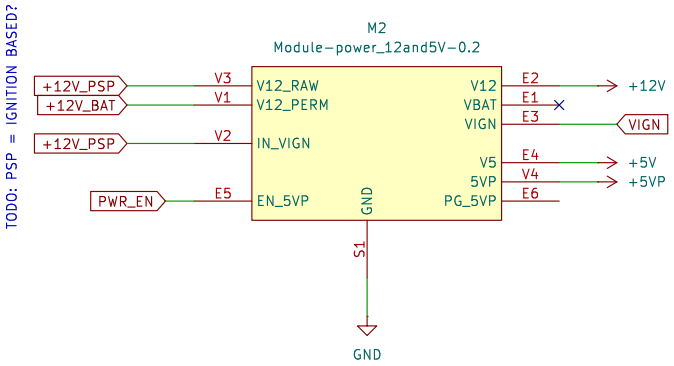
File: bluetooth.kicad_sch

Outputs

File: outputs.kicad_sch

TODO:
Do we need to connect PSP2? Like connect it directly to PSP1 or sth? Measure at OEM ECU.
DONE: GEARSENS analyze the signal -> Kind of analog?
DONE: AM POSITION = FICMPSNS Hall effect or what is that?
Knock Sensor LOW signals not needed?





GND TP1 TestPoint_Probe
+3V3 TP2 TestPoint_Probe
+5V TP3 TestPoint_Probe
+12V TP4 TestPoint_Probe
+3V3SW TP5 TestPoint_Probe

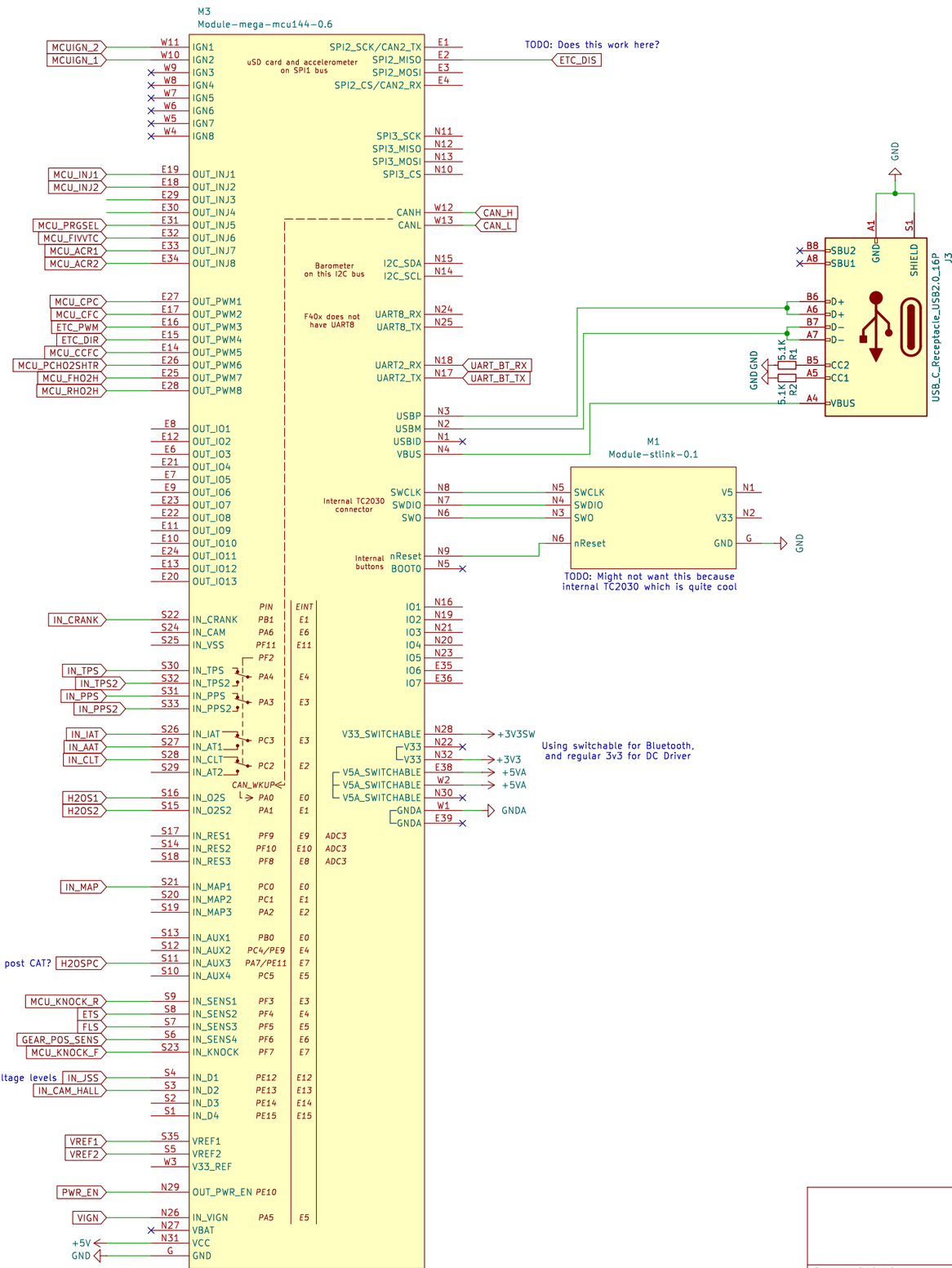
FID1 Fiducial
FID2 Fiducial
FID3 Fiducial
FID4 Fiducial

Hellen-Bremen

Sheet: /
File: hellenbremen.kicad_sch

Title:

Size: A4	Date:	**Rev:** A
KiCad E.D.A. 8.0.6		Id: 1/5



Sheet: /MCU/	
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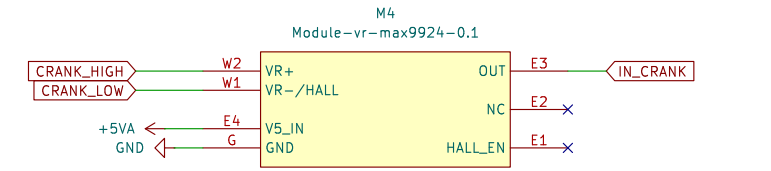
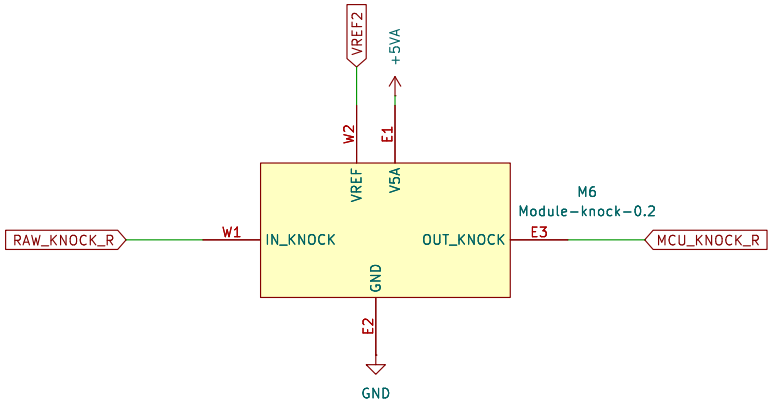
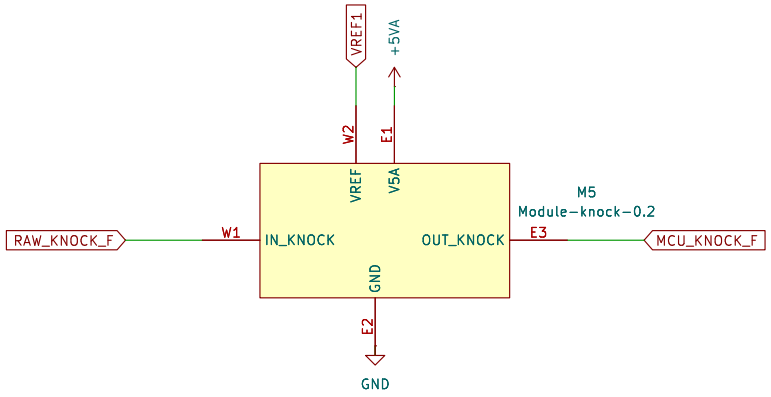
Size: A3	Date:
KiCad E.D.A. 8.0.6	Id: 2/5
	Rev:







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File: sensors.kicad_sch

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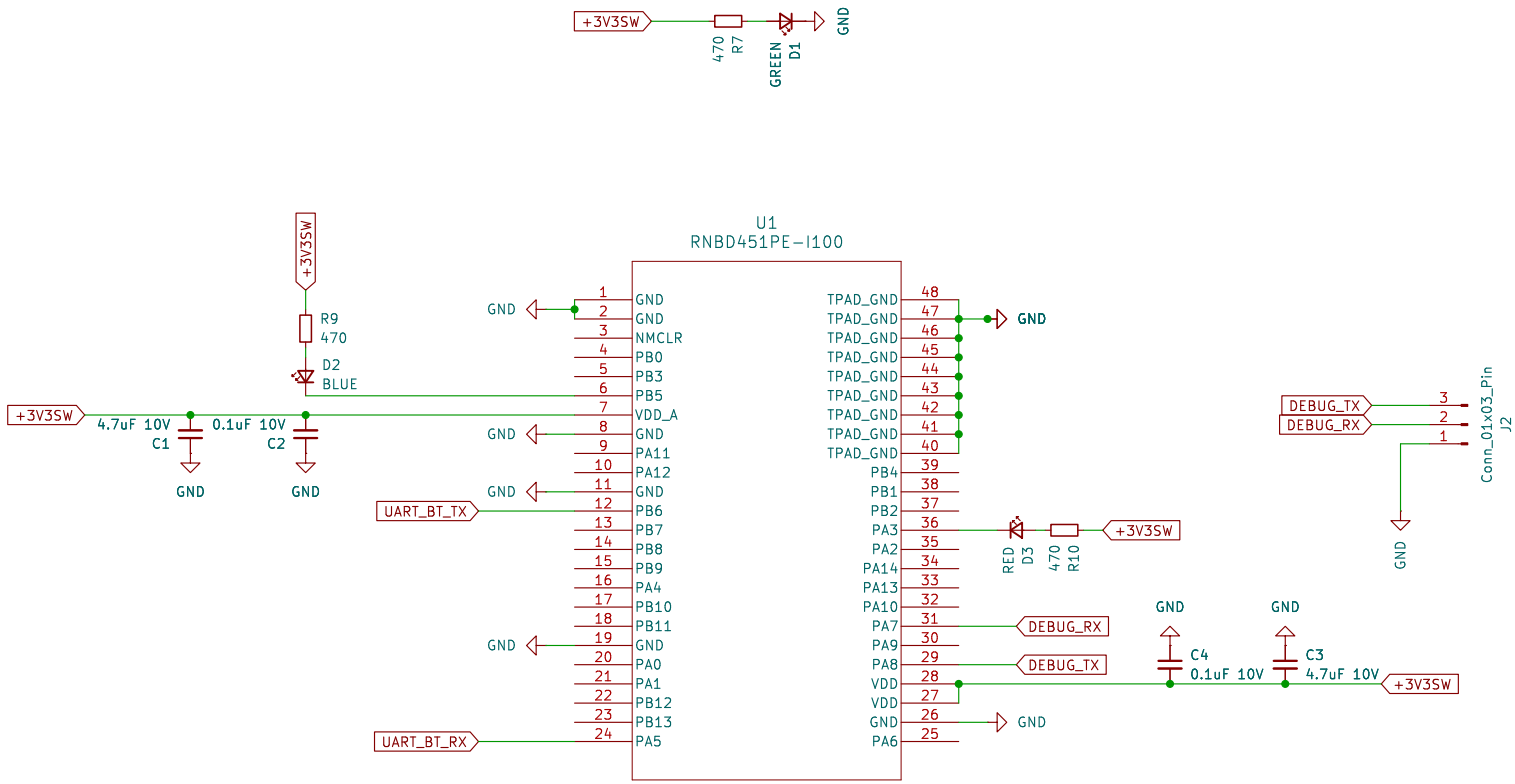
KiCad E.D.A. 8.0.6		Id: 4/5



Sheet: /Bluetooth/
File: bluetooth.kicad_sch

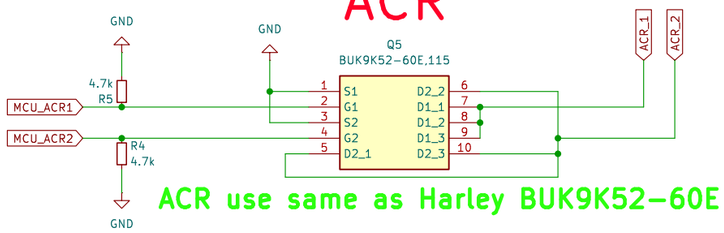
Title:

Size: A4	Date:	**Rev:**
KiCad E.D.A. 8.0.6		Id: 5/5

INJECTORS

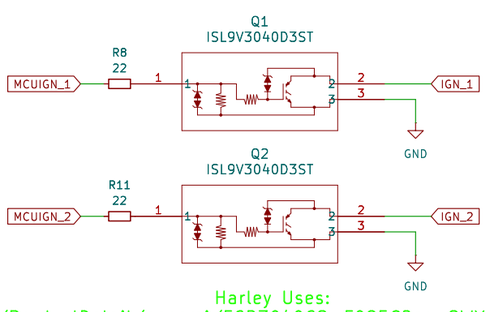
INJECTORS MEASURED TO TAKE MAX 1A EACH WHEN OPEN
VNLD5160TR-E should be fine
HARLEY uses 2N06L35

ACR



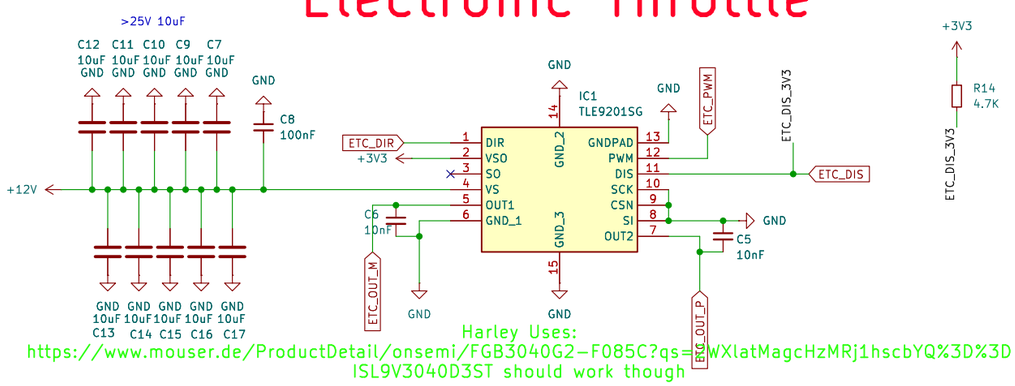
ACR use same as Harley BUK9K52-60E

IGNITION



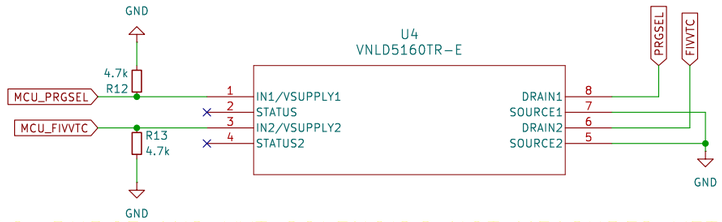
Harley Uses:
https://www.mouser.de/ProductDetail/onsemi/FGB3040G2-F085C?qs=2WXlatMagcHzMRj1hscbYQ%3D%3D
ISL9V3040D3ST should work though

Electronic Throttle



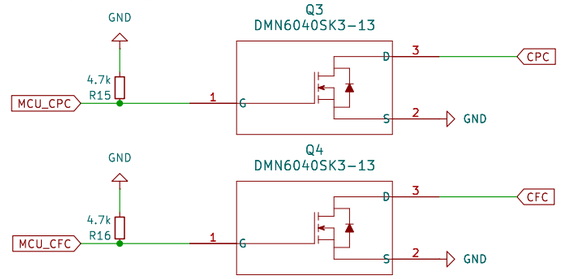
Harley Uses:
https://www.mouser.de/ProductDetail/onsemi/FGB3040G2-F085C?qs=2WXlatMagcHzMRj1hscbYQ%3D%3D
ISL9V3040D3ST should work though

PURGE & VVT SOLENOIDS



TODO: PURGE AND VVT SOLENOIDS NOT MEASURED YET AT ALL

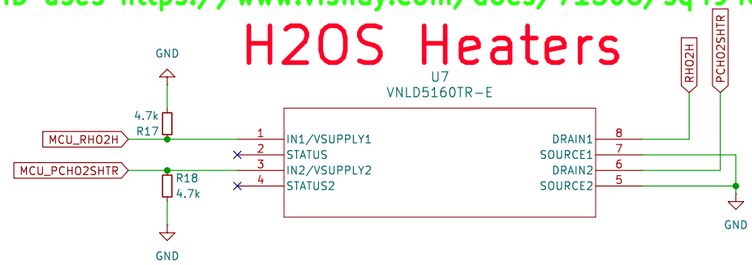
COOLANT FAN & PUMP



COOLANT FAN PULLS AROUND 4A WHEN CONSTANT 100%,
INITIALLY PULLING UP TO 8A FOR GETTING SPINNING
HARLEY USES: HUFA76429D3
POSSIBLE: https://www.digikey.de/de/products/detail/onsemi/HUF76629D3ST/4553106
AND: https://www.digikey.de/de/products/detail/diodes-incorporated/DMN6040SK3-13/8545933
Weytronik: https://www.digikey.de/de/products/detail/vishay-siliconix/SISS54DN-T1-GE3/14004251?s=N4IgTCBcDaIMoEk5wKwBYAiA5EBdAvkA

H2OS Heaters are PWM Controlled and max out at about 0.9 Amps
at room temperature, then reducing with heat coming.
VNLD5160TR-E should work. Will test
HD uses https://www.vishay.com/docs/71506/sq4946aey.pdf

H2OS Heaters



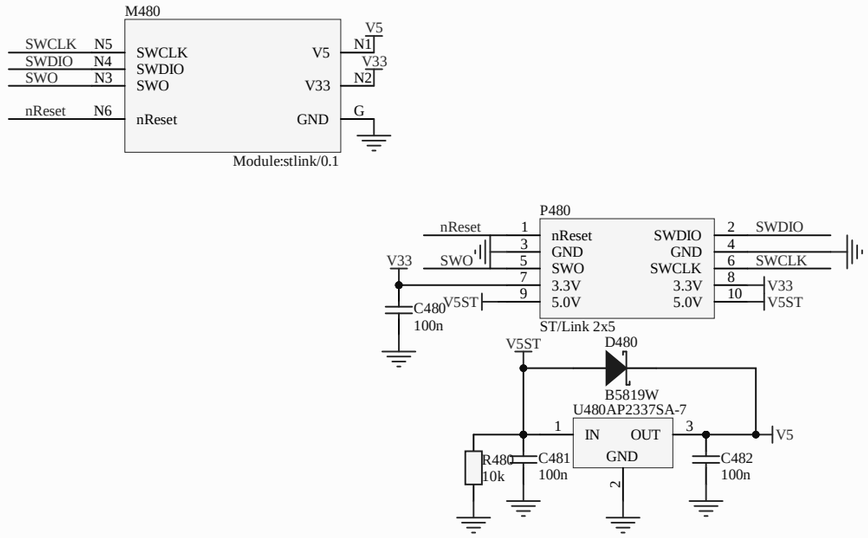
CCFC: Harley uses 2N06L35 TODO!

CCFC & HO2HTR

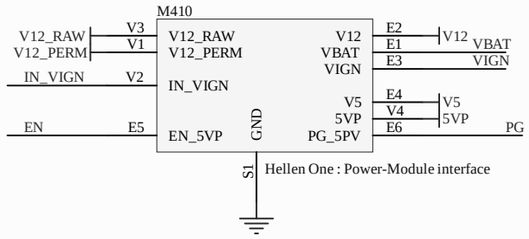
Sheet: /Outputs/
File: outputs.kicad_sch

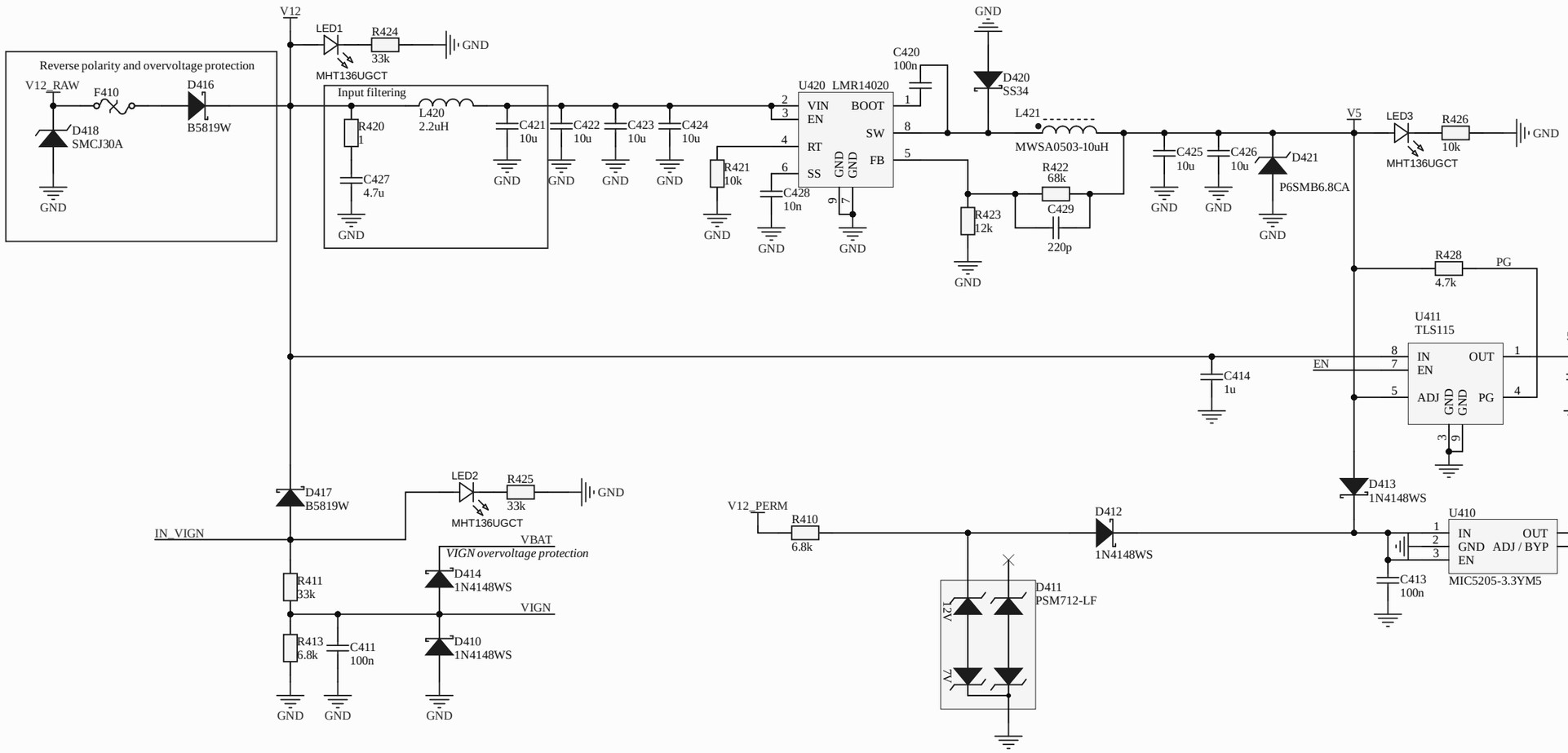
Title:

Size: A3	Date:	**Rev:**
KiCad E.D.A. 8.0.6		Id: 6/5

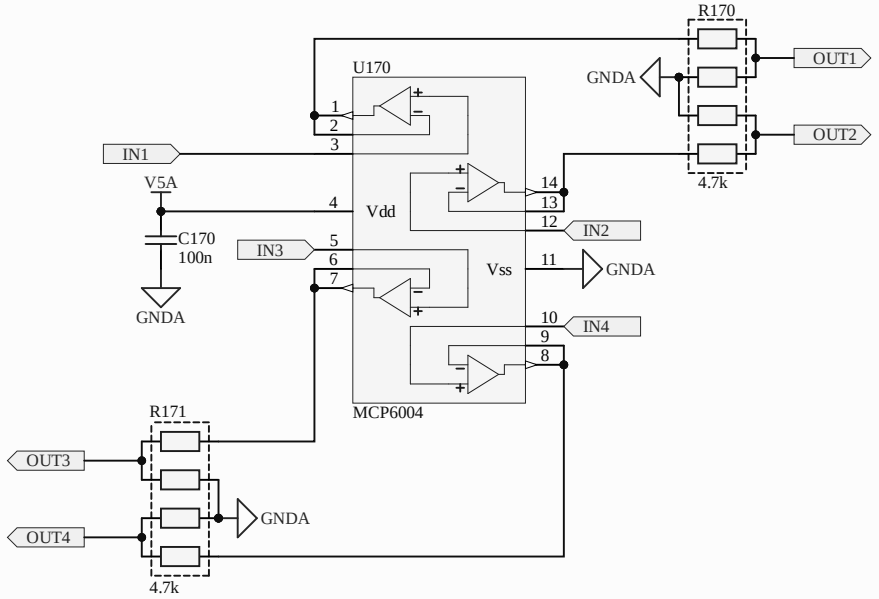


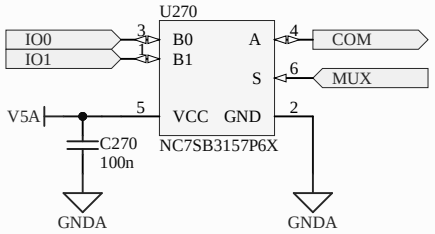
Title: ***Hellen-One ST-Link***			***rusEFI EMS***
Size: A3	Author: andreika	Revision: 0.1	***Hellen-One Platform***
Date: 02.03.2021		Sheet 1 of 1	*https://rusefi.com/s/hellen72*

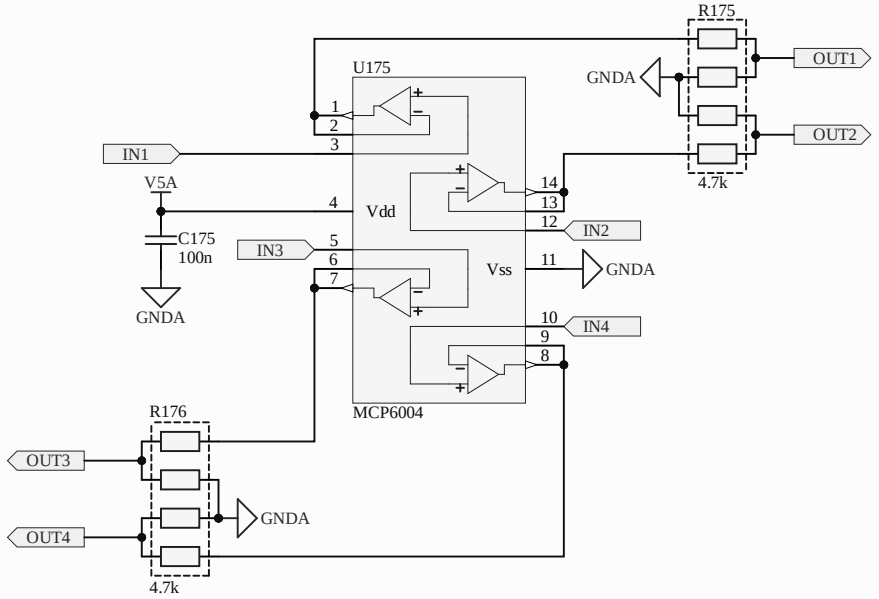


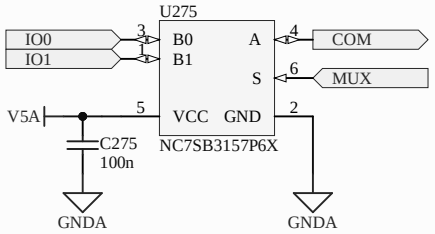


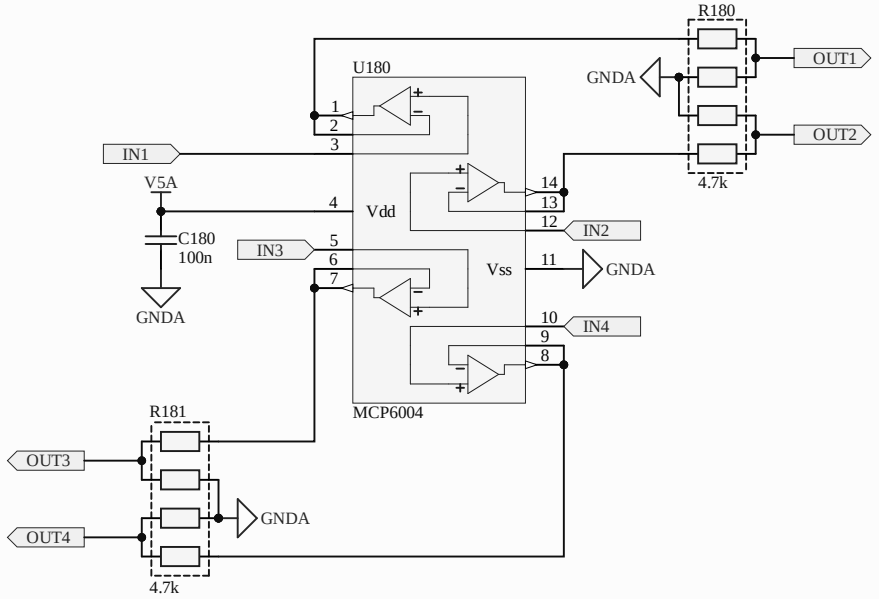
power_12and5V-0.2

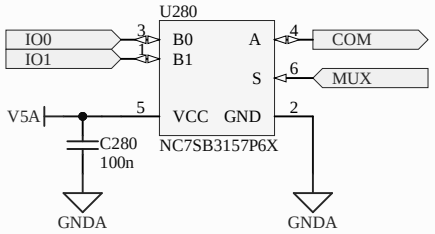

R170
U170
GNDA
OUT1
OUT2
IN1
V5A
Vdd
4.7k
C170
100n
IN3
IN2
Vss
GNDA
GNDA
IN4
MCP6004
R171
OUT3
GNDA
OUT4
4.7k

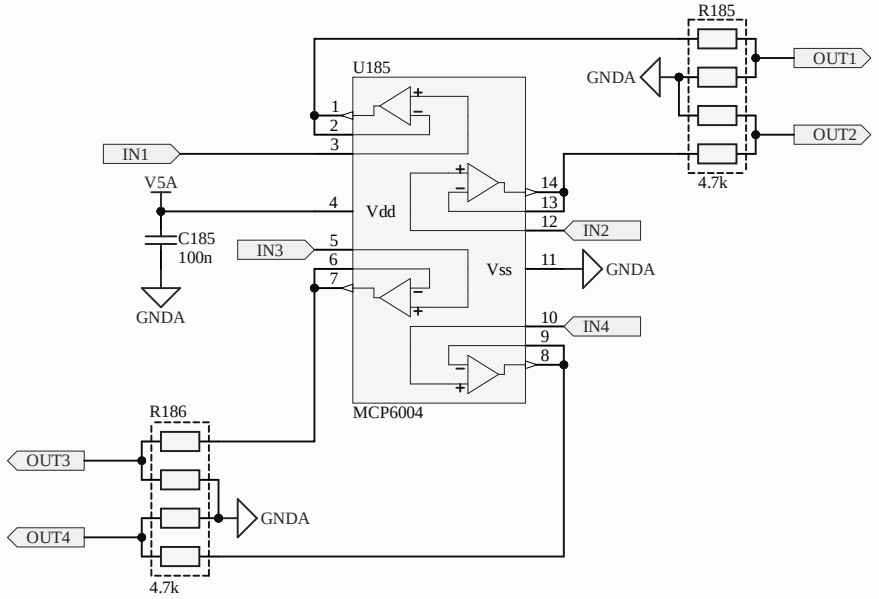

U270
IO0
IO1
3
1
B0
B1
A
S
4
6
COM
MUX
V5A
5
VCC
GND
2
C270
100n
NC7SB3157P6X
GNDA
GNDA

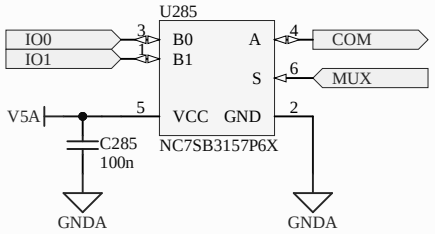

R175
U175
GNDA
OUT1
OUT2
IN1
V5A
Vdd
4.7k
C175
100n
IN3
IN2
Vss
GNDA
GNDA
IN4
MCP6004
R176
OUT3
GNDA
OUT4
4.7k

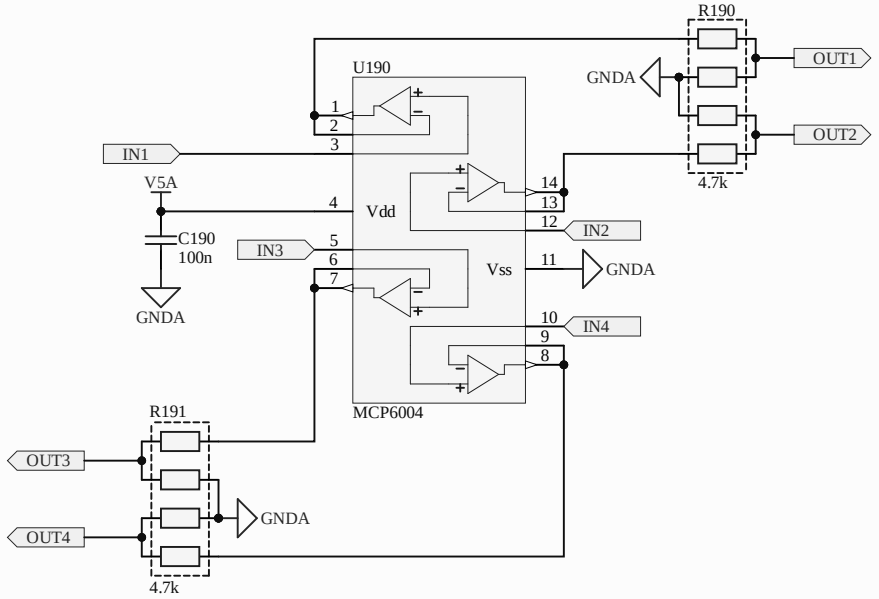

U275
IO0
IO1
3
1
B0
B1
A
S
4
COM
6
MUX
V5A
5
VCC
GND
2
C275
100n
NC7SB3157P6X
GNDA
GNDA

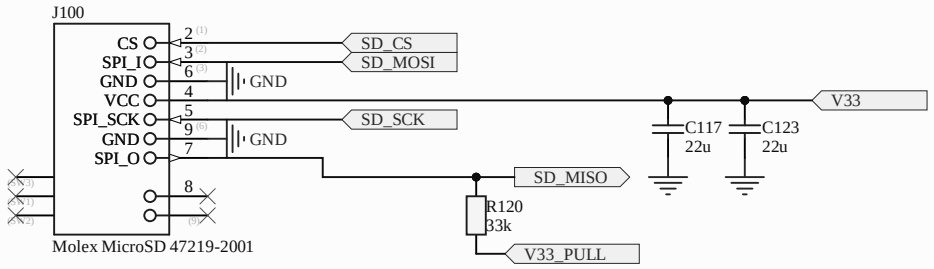

R180
U180
GNDA
OUT1
OUT2
IN1
V5A
Vdd
4.7k
C180
100n
IN3
IN2
Vss
GNDA
GNDA
IN4
MCP6004
R181
OUT3
GNDA
OUT4
4.7k

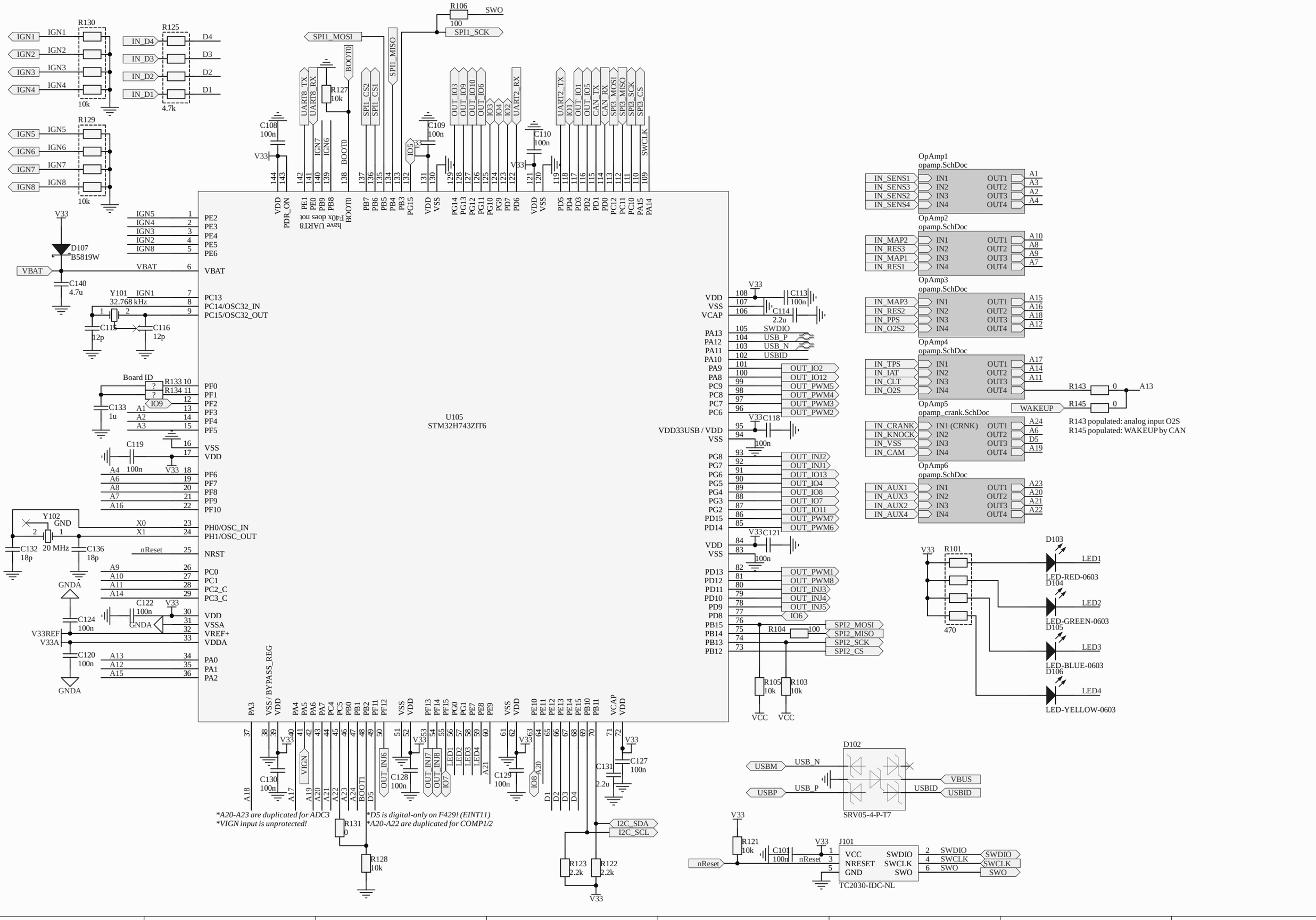

U280
IO0
IO1
3
1
B0
B1
A
S
4
COM
6
MUX
V5A
5
VCC
GND
2
C280
100n
NC7SB3157P6X
GNDA
GNDA

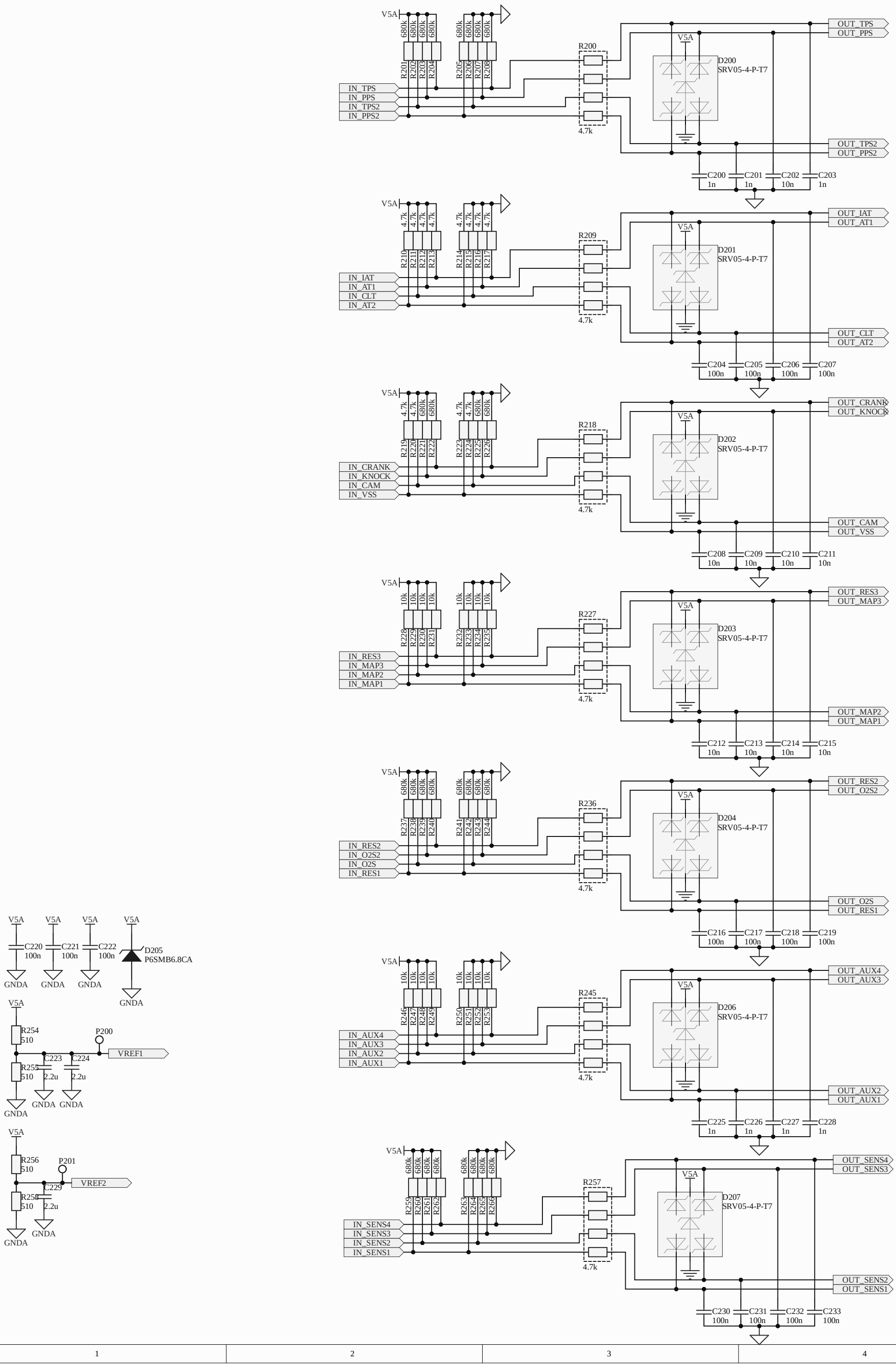

R185
U185
GNDA
OUT1
OUT2
IN1
V5A
Vdd
4.7k
C185
100n
IN3
IN2
Vss
GNDA
GNDA
IN4
MCP6004
R186
OUT3
GNDA
OUT4
4.7k

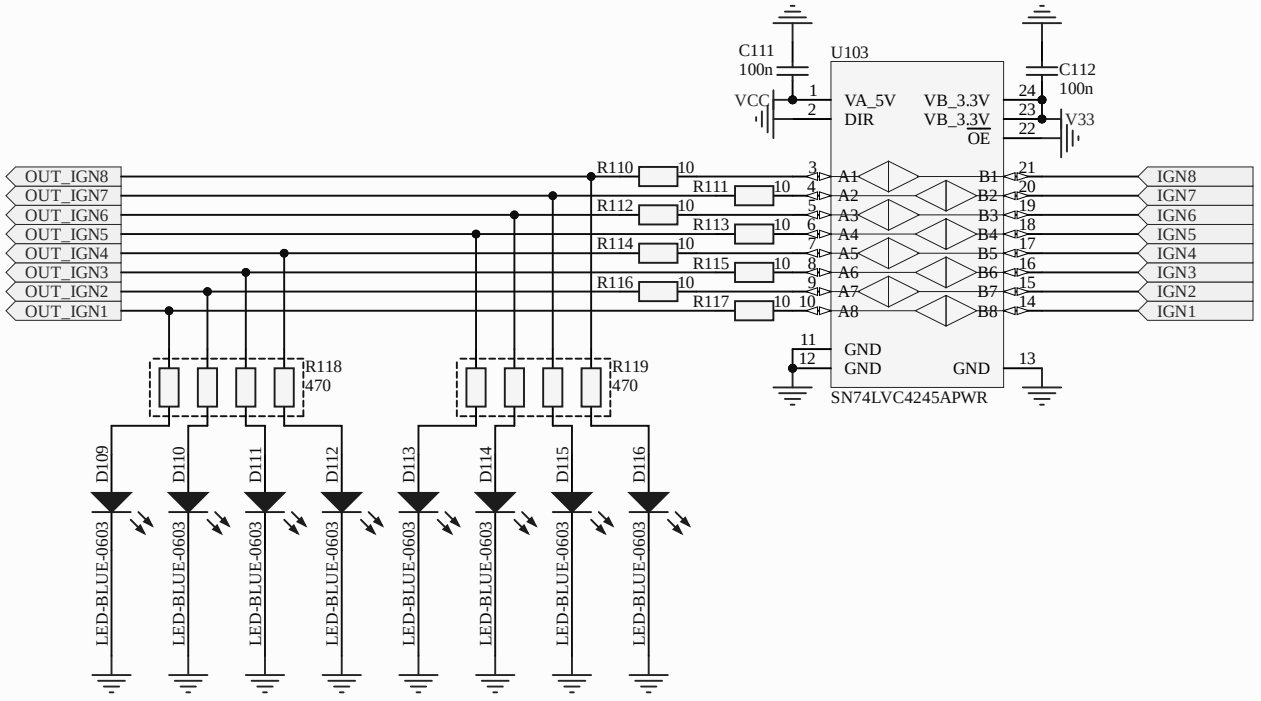

U285
IO0
IO1
3
1
B0
B1
A
S
4
6
COM
MUX
V5A
5
VCC
GND
2
C285
100n
NC7SB3157P6X
GNDA
GNDA

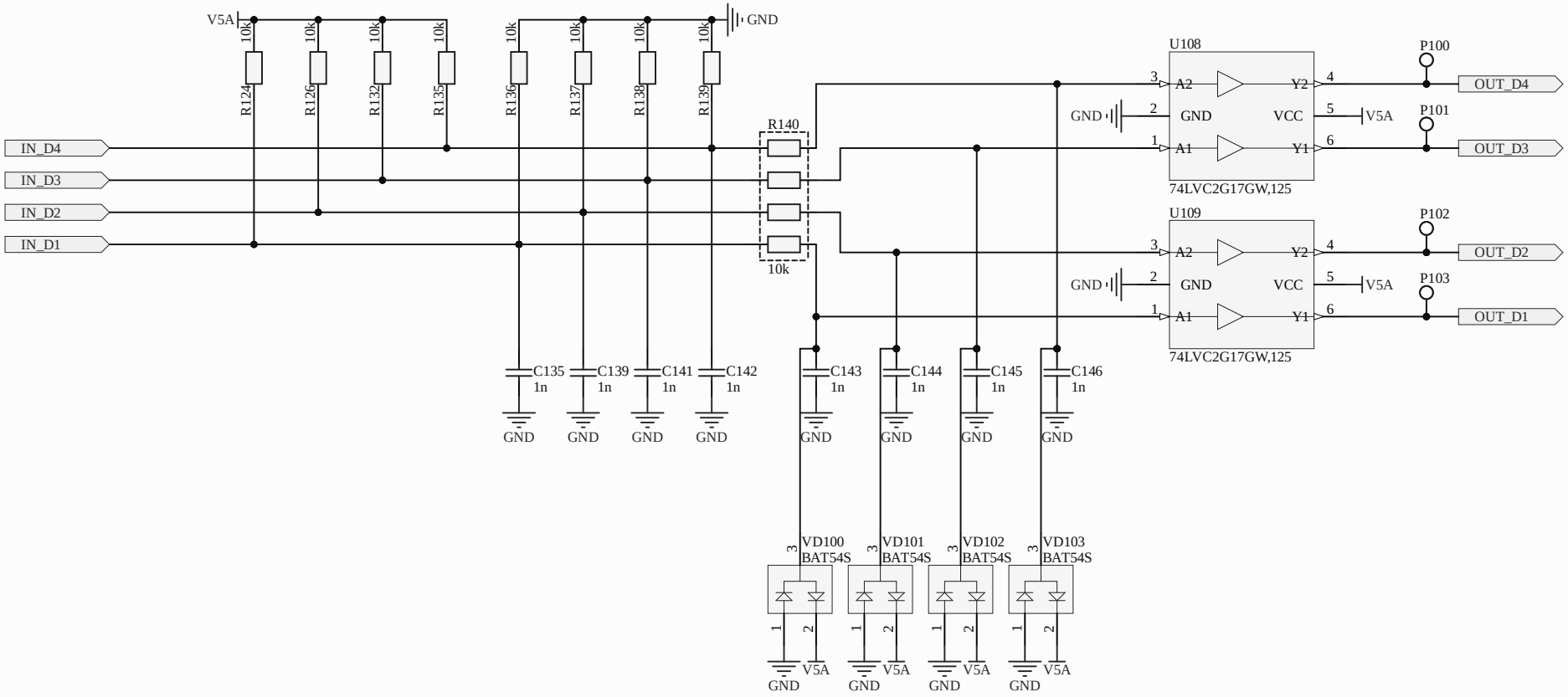

R190
U190
GNDA
OUT1
OUT2
IN1
V5A
Vdd
4.7k
C190
100n
IN3
IN2
Vss
GNDA
GNDA
IN4
MCP6004
R191
OUT3
GNDA
OUT4
4.7k

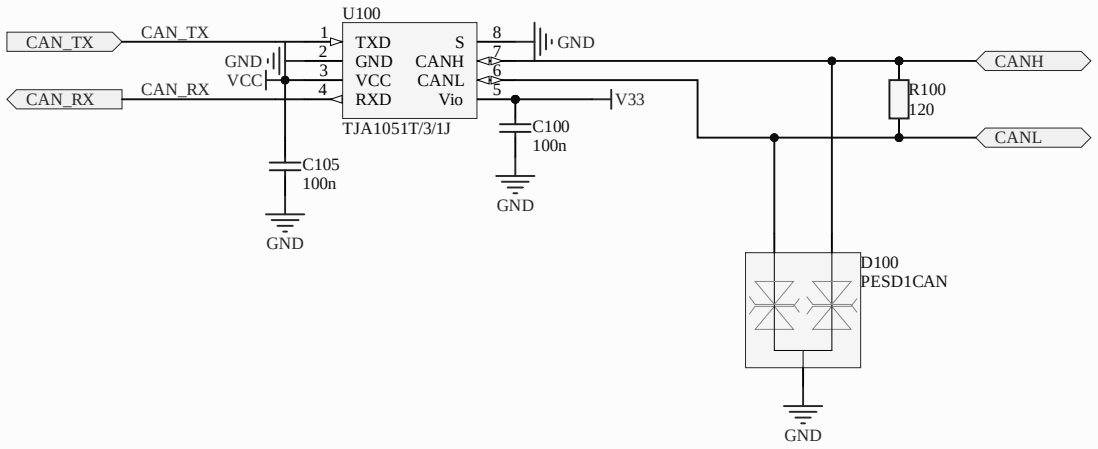

J100
CS
SPI_I
GND
VCC
SPI_SCK
GND
SPI_O
2
3
6
4
5
9
7
8
SD_CS
SD_MOSI
GND
SD_SCK
GND
SD_MISO
R120
33k
V33_PULL
V33
C117
22u
C123
22u
Molex MicroSD 47219-2001

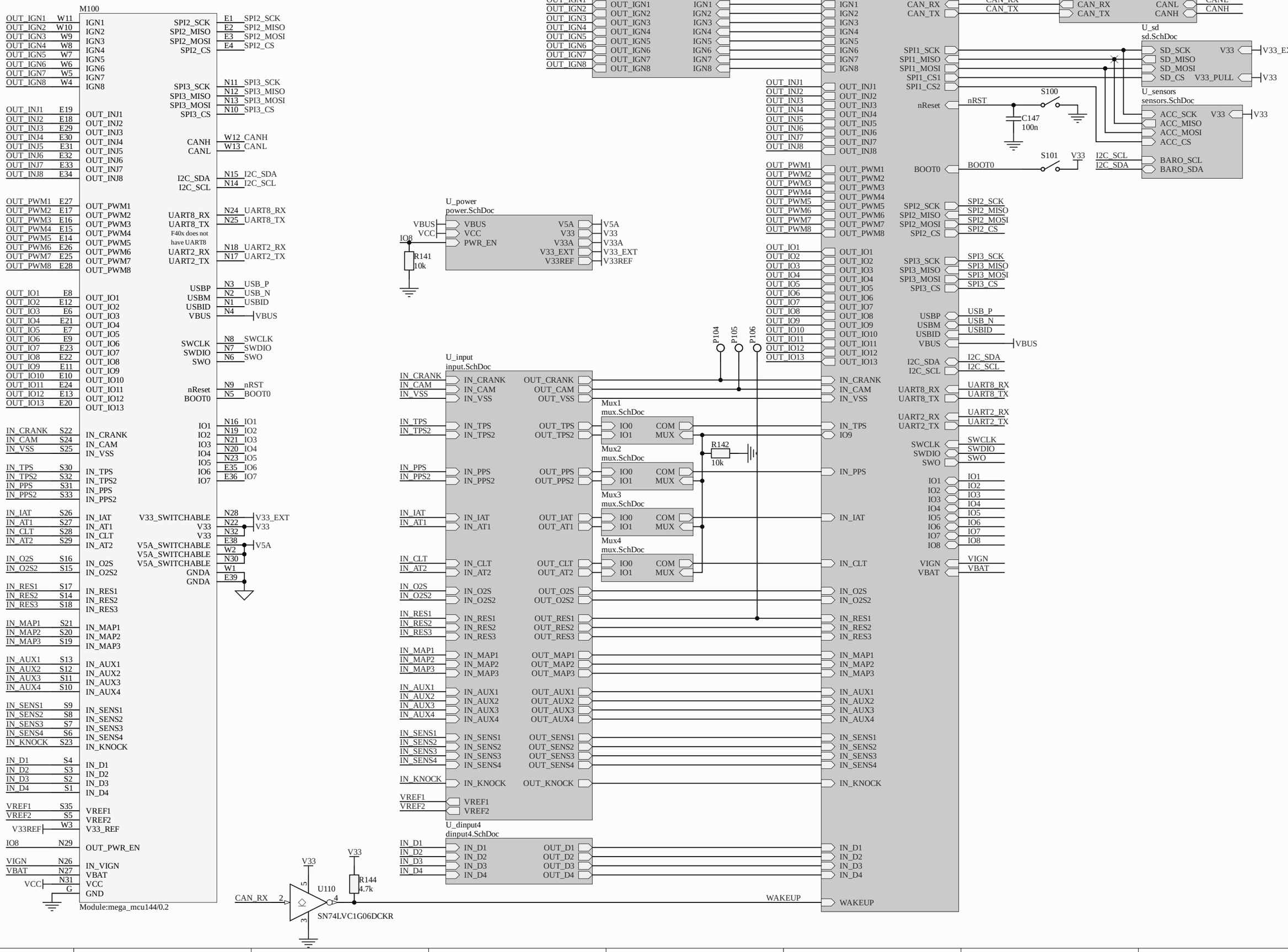

R130
R125
R129
IGN1
IGN2
IGN3
IGN4
IGN5
IGN6
IGN7
IGN8
IN_D4
IN_D3
IN_D2
IN_D1
D4
D3
D2
D1
10k
4.7k
R106
SWO
100
SPI1_SCK
SPI1_MOSI
SPI1_MISO
R127
10k
BOOT0
C108
100n
C109
100n
C110
100n
V33
UART8_TX
UART8_RX
SPI1_CS2
SPI1_CS1
IO5
OUT_IO3
OUT_IO9
OUT_IO10
OUT_IO6
IO3
IO4
IO2
UART2_RX
UART2_TX
IO1
OUT_IO1
OUT_IO5
CAN_TX
CAN_RX
SPI3_MOSI
SPI3_MISO
SPI3_SCK
SPI3_CS
SWCLK
VDD
PDR_ON
PE1
PE0
PB9
PB8
BOOT0
PB7
PB6
PB5
PB4
PB3
PG15
PG14
PG13
PG12
PG11
PG10
PC9
PD7
PD6
PD5
PD4
PD3
PD2
PD1
PD0
PC12
PC11
PC10
PA15
PA14
have UART8
F40x does not
U105
STM32H743ZIT6
D107
B5819W
VBAT
C140
4.7u
Y101
32.768 kHz
C115
12p
C116
12p
PE2
PE3
PE4
PE5
PE6
PC13
PC14/OSC32_IN
PC15/OSC32_OUT
Board ID
R133
R134
C133
1u
C119
100n
PF0
PF1
PF2
PF3
PF4
PF5
PF6
PF7
PF8
PF9
PF10
Y102
20 MHz
C132
18p
C136
18p
PH0/OSC_IN
PH1/OSC_OUT
nReset
NRST
PC0
PC1
PC2_C
PC3_C
C122
100n
C124
100n
C120
100n
V33REF
V33A
GNDA
VDD
VSSA
VREF+
VDDA
PA0
PA1
PA2
PA3
VSS / BYPASS_REG
PA4
PA5
PA6
PA7
PC4
PC5
PB0
PB1
PB2
PF11
PF12
VSS
PF13
PF14
PF15
PG0
PG1
PE7
PE8
PE9
PE10
PE11
PE12
PE13
PE14
PE15
PB10
PB11
VCAP
C130
100n
C128
100n
C129
100n
C131
2.2u
C127
100n
VIGN
OUT_IN6
OUT_IN7
OUT_IN8
IO7
IO8
LED1
LED2
LED3
LED4
A21
A20
BOOT1
D5
D1
D2
D3
D4
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
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
OpAmp2
opamp.SchDoc
OpAmp3
opamp.SchDoc
OpAmp4
opamp.SchDoc
OpAmp5
opamp_crank.SchDoc
OpAmp6
opamp.SchDoc
IN_SENS1
IN_SENS3
IN_SENS2
IN_SENS4
IN_MAP2
IN_RES3
IN_MAP1
IN_RES1
IN_MAP3
IN_RES2
IN_PPS
IN_O2S2
IN_TPS
IN_IAT
IN_CLT
IN_O2S
IN_CRANK
IN_KNOCK
IN_VSS
IN_CAM
IN_AUX1
IN_AUX3
IN_AUX2
IN_AUX4
IN1
IN2
IN3
IN4
OUT1
OUT2
OUT3
OUT4
A1
A3
A2
A4
A10
A8
A9
A7
A15
A16
A18
A12
A17
A14
A11
A24
A6
D5
A19
A23
A20
A21
A22
R143
0
A13
WAKEUP
R145
0
R143 populated: analog input O2S
R145 populated: WAKEUP by CAN
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
nReset
J101
VCC
NRESET
GND
SWDIO
SWCLK
SWO
TC2030-IDC-NL

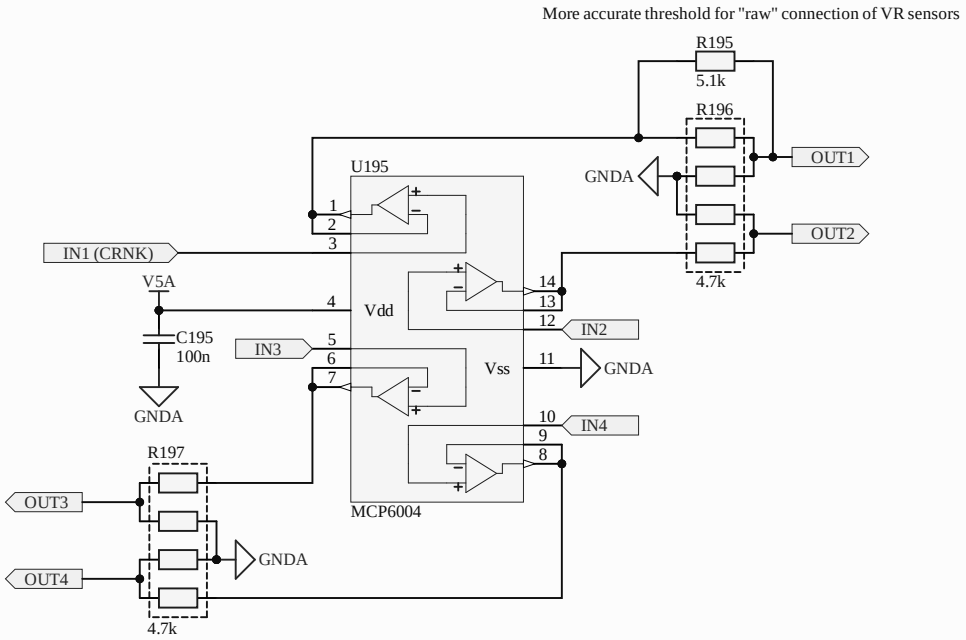

V5A
680k
R201
R202
R203
R204
R205
R206
R207
R208
IN_TPS
IN_PPS
IN_TPS2
IN_PPS2
R200
4.7k
D200
SRV05-4-P-T7
OUT_TPS
OUT_PPS
OUT_TPS2
OUT_PPS2
C200 1n
C201 1n
C202 10n
C203 1n
4.7k
R210
R211
R212
R213
R214
R215
R216
R217
IN_IAT
IN_AT1
IN_CLT
IN_AT2
R209
D201
OUT_IAT
OUT_AT1
OUT_CLT
OUT_AT2
C204 100n
C205 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
P200
VREF1
C223
C224
R255 510
2.2u
R256 510
P201
VREF2
C229
R258 510

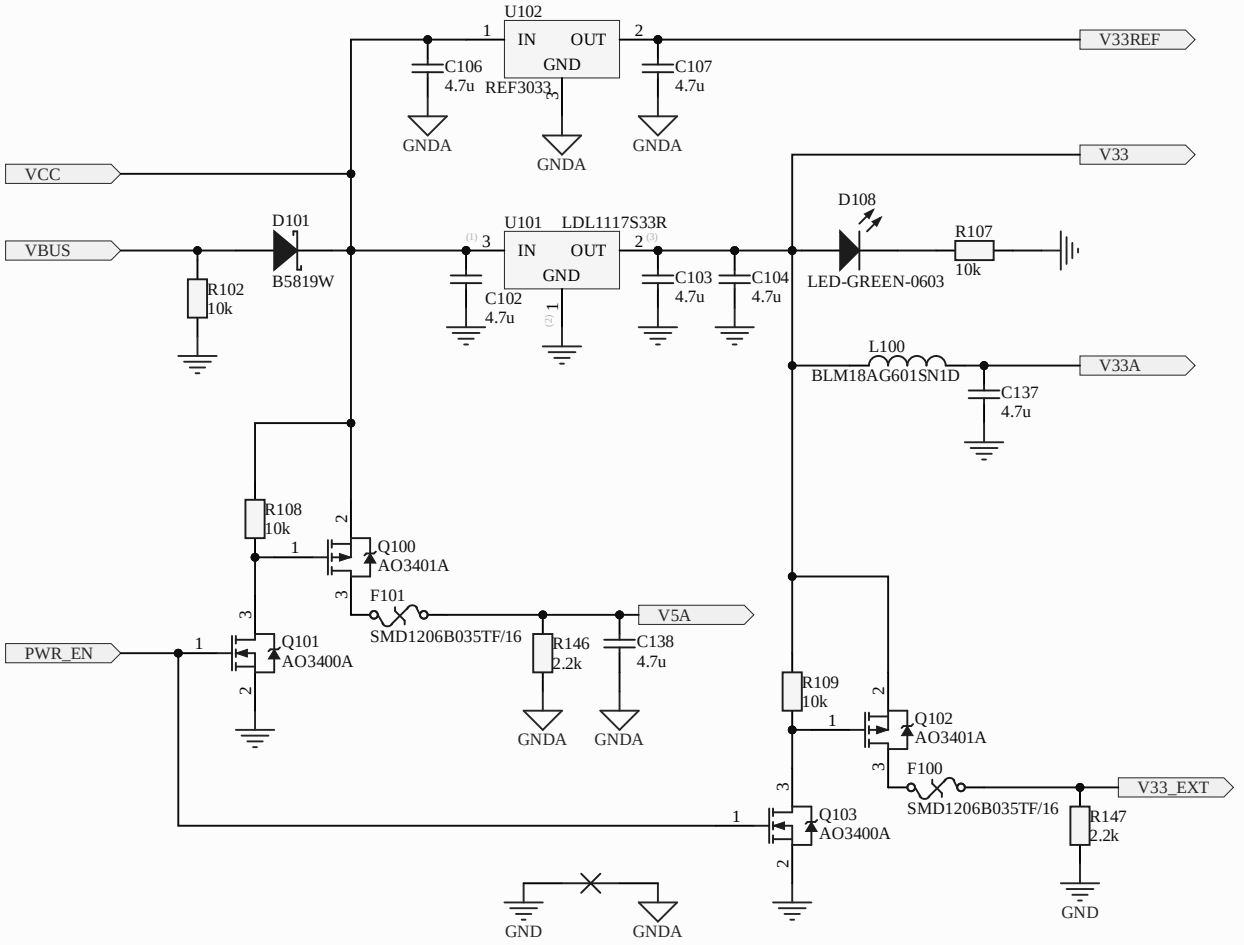

C111
100n
U103
C112
100n
VCC
VA_5V
VB_3.3V
DIR
VB_3.3V
OE
V33
OUT_IGN8
OUT_IGN7
OUT_IGN6
OUT_IGN5
OUT_IGN4
OUT_IGN3
OUT_IGN2
OUT_IGN1
R110
R111
R112
R113
R114
R115
R116
R117
10
A1
A2
A3
A4
A5
A6
A7
A8
B1
B2
B3
B4
B5
B6
B7
B8
IGN8
IGN7
IGN6
IGN5
IGN4
IGN3
IGN2
IGN1
GND
GND
GND
SN74LVC4245APWR
R118
470
R119
470
D109
D110
D111
D112
D113
D114
D115
D116
LED-BLUE-0603


V5A
GND
10k
R124
R126
R132
R135
R136
R137
R138
R139
R140
IN_D4
IN_D3
IN_D2
IN_D1
C135 1n
C139 1n
C141 1n
C142 1n
C143 1n
C144 1n
C145 1n
C146 1n
U108
U109
74LVC2G17GW,125
A2
A1
GND
VCC
Y2
Y1
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
OUT_INJ1
OUT_INJ2
OUT_INJ3
OUT_INJ4
OUT_INJ5
OUT_INJ6
OUT_INJ7
OUT_INJ8
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
OUT_PWM1
OUT_PWM2
OUT_PWM3
OUT_PWM4
OUT_PWM5
OUT_PWM6
OUT_PWM7
OUT_PWM8
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
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
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_CRANK
IN_CAM
IN_VSS
IN_TPS S30
IN_TPS2 S32
IN_PPS S31
IN_PPS2 S33
IN_TPS
IN_TPS2
IN_PPS
IN_PPS2
IN_IAT S26
IN_AT1 S27
IN_CLT S28
IN_AT2 S29
IN_O2S S16
IN_O2S2 S15
IN_IAT
IN_AT1
IN_CLT
IN_AT2
IN_O2S
IN_O2S2
V33_SWITCHABLE N28 V33_EXT
V33 N22 V33
V33 N32
E38
V5A_SWITCHABLE W2 V5A
V5A_SWITCHABLE
V5A_SWITCHABLE N30
GNDA W1
GNDA E39
IN_RES1 S17
IN_RES2 S14
IN_RES3 S18
IN_RES1
IN_RES2
IN_RES3
IN_MAP1 S21
IN_MAP2 S20
IN_MAP3 S19
IN_MAP1
IN_MAP2
IN_MAP3
IN_AUX1 S13
IN_AUX2 S12
IN_AUX3 S11
IN_AUX4 S10
IN_AUX1
IN_AUX2
IN_AUX3
IN_AUX4
IN_SENS1 S9
IN_SENS2 S8
IN_SENS3 S7
IN_SENS4 S6
IN_KNOCK S23
IN_SENS1
IN_SENS2
IN_SENS3
IN_SENS4
IN_KNOCK
IN_D1 S4
IN_D2 S3
IN_D3 S2
IN_D4 S1
IN_D1
IN_D2
IN_D3
IN_D4
VREF1 S35
VREF2 S5
V33REF W3
VREF1
VREF2
V33_REF
IO8 N29
OUT_PWR_EN
VIGN N26
VBAT N27
IN_VIGN
VBAT
VCC N31
G
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
IGN1
IGN2
IGN3
IGN4
IGN5
IGN6
IGN7
IGN8
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
IN_CRANK
IN_CAM
IN_VSS
IN_TPS
IO9
IN_PPS
IN_IAT
IN_CLT
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
WAKEUP
CAN_RX
CAN_TX
SPI1_SCK
SPI1_MISO
SPI1_MOSI
SPI1_CS1
SPI1_CS2
nReset
BOOT0
SPI2_SCK
SPI2_MISO
SPI2_MOSI
SPI2_CS
SPI3_SCK
SPI3_MISO
SPI3_MOSI
SPI3_CS
USBP
USBM
USBID
VBUS
I2C_SDA
I2C_SCL
UART8_RX
UART8_TX
UART2_RX
UART2_TX
SWCLK
SWDIO
SWO
IO1
IO2
IO3
IO4
IO5
IO6
IO7
IO8
VIGN
VBAT
U_can
can.SchDoc
CAN_RX
CAN_TX
CANL
CANH
U_sd
sd.SchDoc
SD_SCK
SD_MISO
SD_MOSI
SD_CS
V33
V33_PULL
V33_EXT
U_sensors
sensors.SchDoc
ACC_SCK
ACC_MISO
ACC_MOSI
ACC_CS
BARO_SCL
BARO_SDA
S100
S101
C147
100n
U_power
power.SchDoc
VBUS
VCC
PWR_EN
V5A
V33
V33A
V33_EXT
V33REF
IO8
R141
10k
U_input
input.SchDoc
IN_CRANK
IN_CAM
IN_VSS
OUT_CRANK
OUT_CAM
OUT_VSS
IN_TPS
IN_TPS2
OUT_TPS
OUT_TPS2
IN_PPS
IN_PPS2
OUT_PPS
OUT_PPS2
IN_IAT
IN_AT1
OUT_IAT
OUT_AT1
IN_CLT
IN_AT2
OUT_CLT
OUT_AT2
IN_O2S
IN_O2S2
OUT_O2S
OUT_O2S2
IN_RES1
IN_RES2
IN_RES3
OUT_RES1
OUT_RES2
OUT_RES3
IN_MAP1
IN_MAP2
IN_MAP3
OUT_MAP1
OUT_MAP2
OUT_MAP3
IN_AUX1
IN_AUX2
IN_AUX3
IN_AUX4
OUT_AUX1
OUT_AUX2
OUT_AUX3
OUT_AUX4
IN_SENS1
IN_SENS2
IN_SENS3
IN_SENS4
OUT_SENS1
OUT_SENS2
OUT_SENS3
OUT_SENS4
IN_KNOCK
OUT_KNOCK
VREF1
VREF2
P104
P105
P106
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
CAN_RX
SN74LVC1G06DCKR


More accurate threshold for "raw" connection of VR sensors
R195
5.1k
R196
4.7k
GNDA
OUT1
OUT2
U195
1
2
3
IN1 (CRNK)
V5A
4
Vdd
C195
100n
GNDA
IN3
5
6
7
14
13
12
IN2
Vss
11
GNDA
10
9
8
IN4
MCP6004
R197
OUT3
OUT4
GNDA
4.7k



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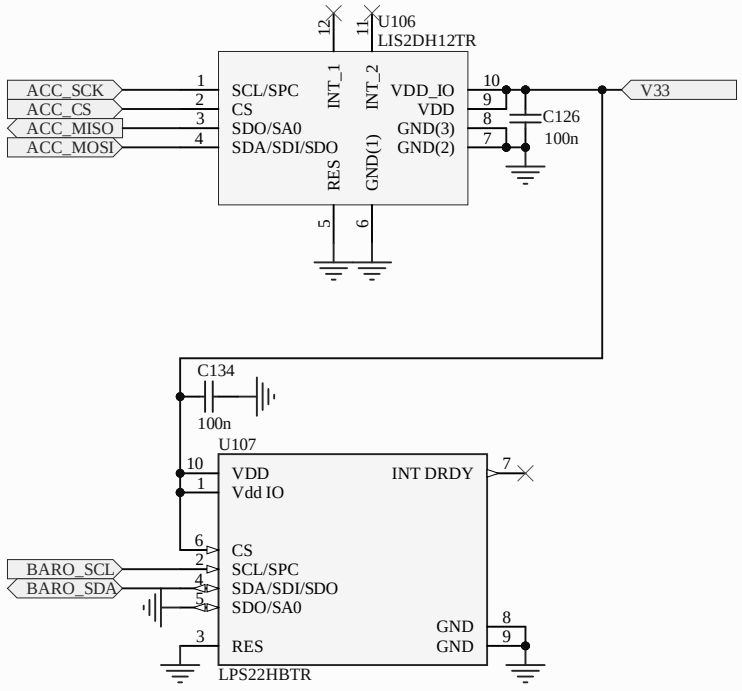
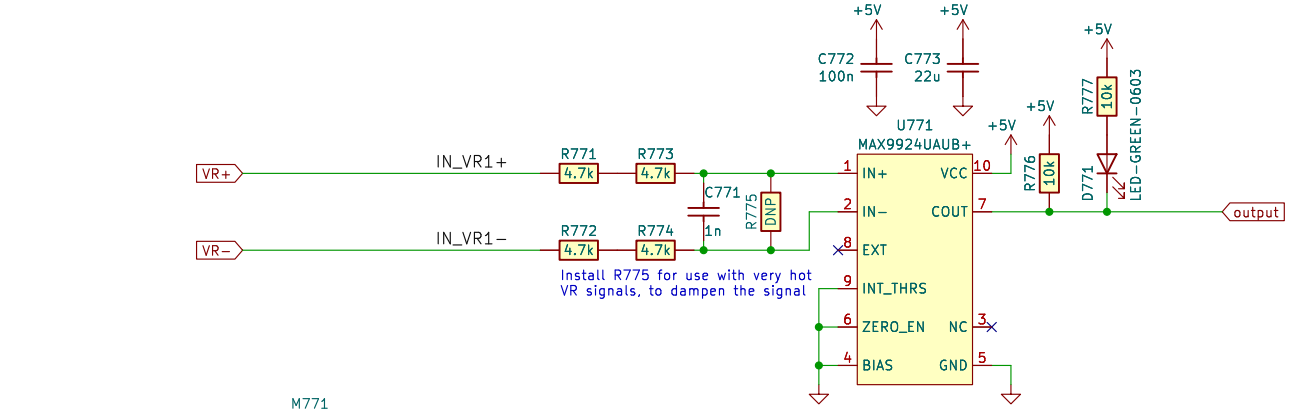

U106
LIS2DH12TR
ACC_SCK
ACC_CS
ACC_MISO
ACC_MOSI
SCL/SPC
CS
SDO/SA0
SDA/SDI/SDO
INT_1
INT_2
RES
GND(1)
VDD_IO
VDD
GND(3)
GND(2)
C126
100n
V33
C134
100n
U107
VDD
Vdd IO
INT DRDY
CS
SCL/SPC
SDA/SDI/SDO
SDO/SA0
RES
GND
GND
BARO_SCL
BARO_SDA
LPS22HBTR



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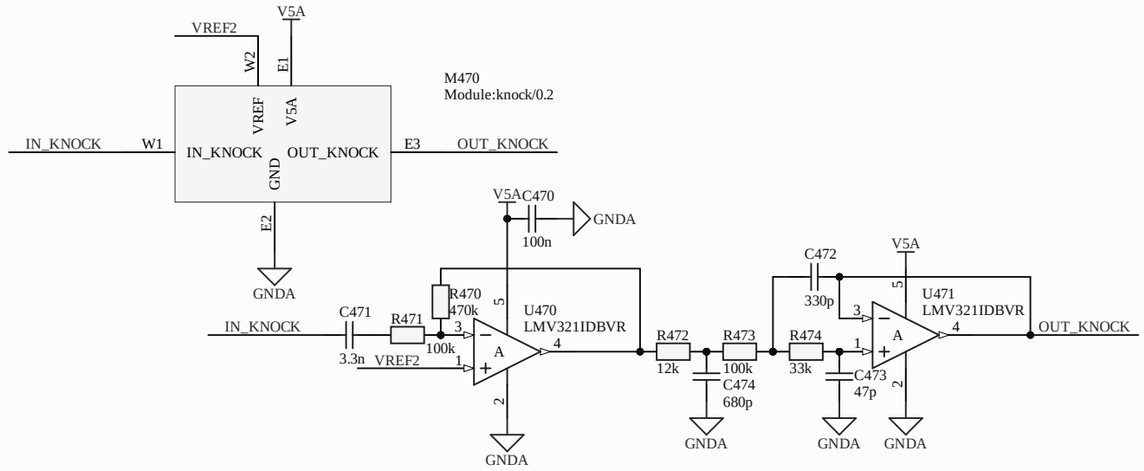
Title: VR MAX9924 module

Size: A4	Date: 2023−07−25	**Rev: 0.1**
KiCad E.D.A. eeschema 7.0.9		Id: 1/1



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	