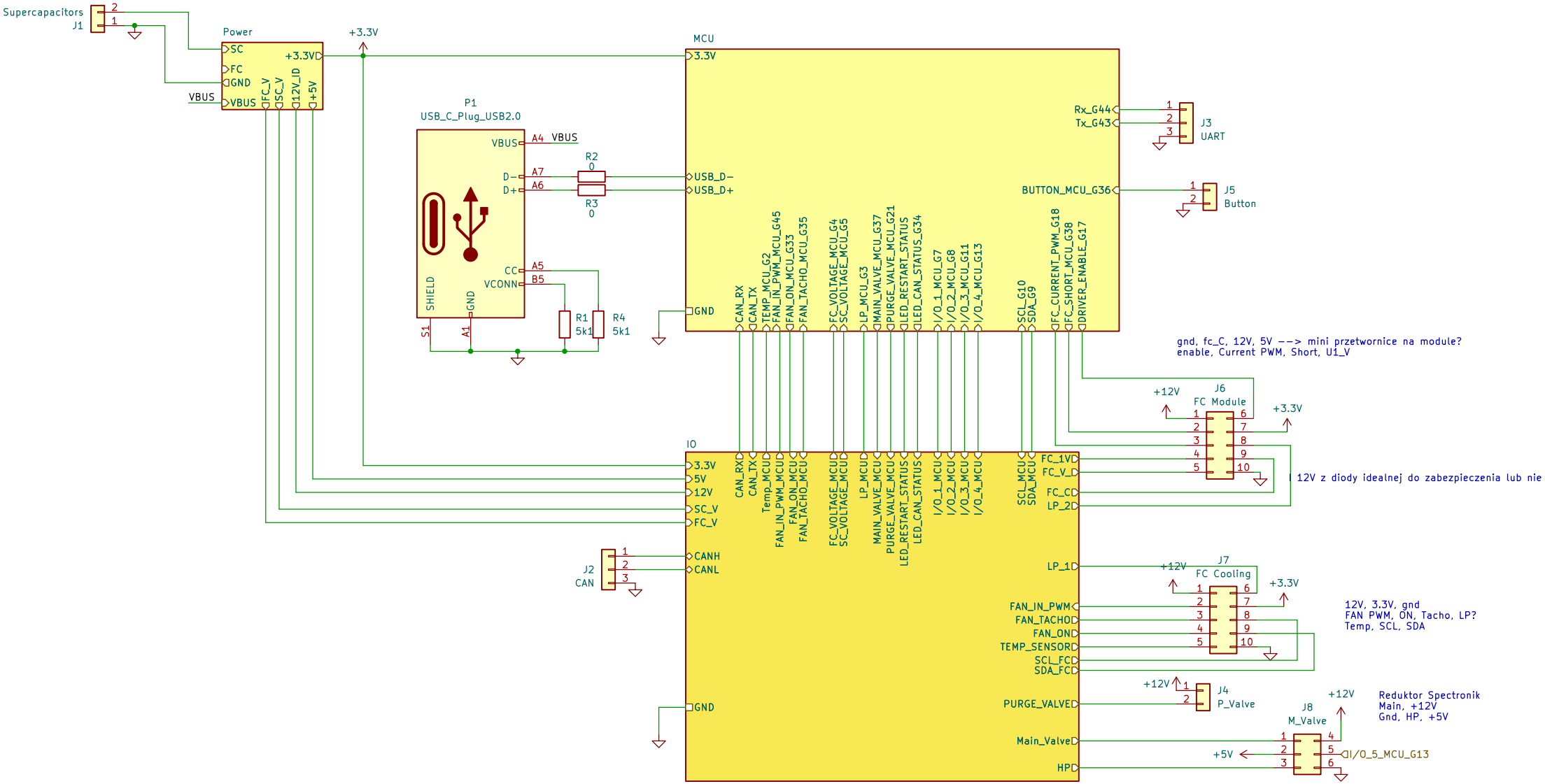
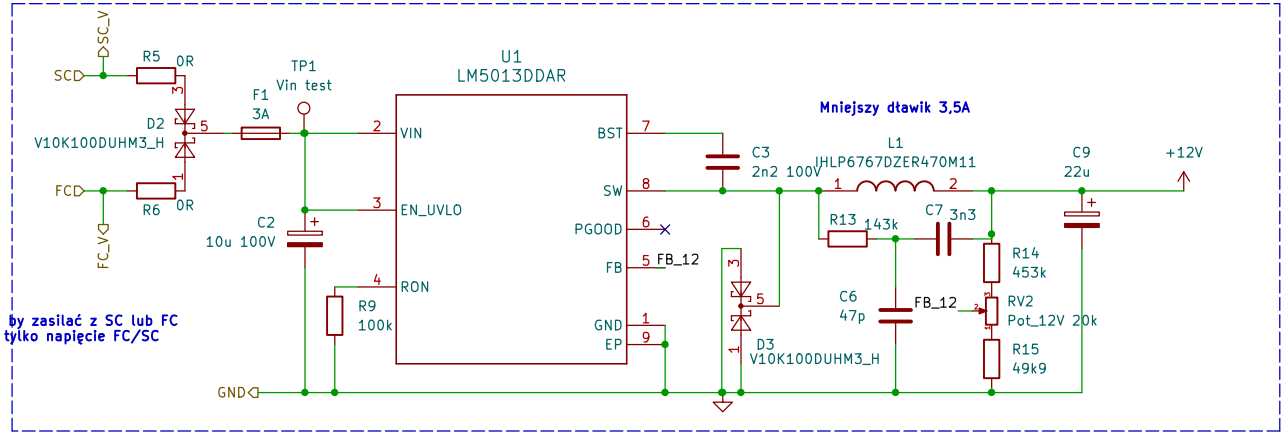
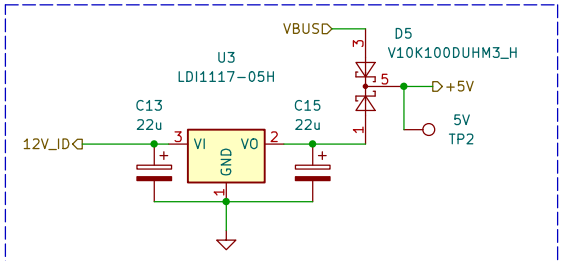

Supercapacitors
J1
Power
SC
FC
GND
VBUS
+3.3V
FC_V
SC_V
12V_ID
+5V
VBUS
+3.3V
P1
USB_C_Plug_USB2.0
VBUS
A4 VBUS
D-
A7
D+
A6
CC
A5
VCONN
B5
SHIELD
GND
A1
S1
R2
0
R3
0
R1
5k1
R4
5k1
MCU
3.3V
USB_D-
USB_D+
GND
CAN_RX
CAN_TX
TEMP_MCU_G2
FAN_IN_PWM_MCU_G45
FAN_ON_MCU_G33
FAN_TACHO_MCU_G35
FC_VOLTAGE_MCU_G4
SC_VOLTAGE_MCU_G5
LP_MCU_G3
MAIN_VALVE_MCU_G37
PURGE_VALVE_MCU_G21
LED_RESTART_STATUS
LED_CAN_STATUS_G34
I/O_1_MCU_G7
I/O_2_MCU_G8
I/O_3_MCU_G11
I/O_4_MCU_G13
SCL_G10
SDA_G9
FC_CURRENT_PWM_G18
FC_SHORT_MCU_G38
DRIVER_ENABLE_G17
Rx_G44
Tx_G43
J3
UART
BUTTON_MCU_G36
J5
Button
gnd, fc_C, 12V, 5V --> mini przetwornice na module?
enable, Current PWM, Short, U1_V
J6
FC Module
+12V
+3.3V
12V z diody idealnej do zabezpieczenia lub nie
IO
3.3V
5V
12V
SC_V
FC_V
CANH
CANL
J2
CAN
GND
FC_1V
FC_V
FC_C
LP_2
LP_1
FAN_IN_PWM
FAN_TACHO
FAN_ON
TEMP_SENSOR
SCL_FC
SDA_FC
PURGE_VALVE
Main_Valve
HP
J7
FC Cooling
12V, 3.3V, gnd
FAN PWM, ON, Tacho, LP?
Temp, SCL, SDA
J4
P_Valve
J8
M_Valve
Reduktor Spectronik
Main, +12V
Gnd, HP, +5V
+5V
I/O_5_MCU_G13

Buck converter (+12 V)

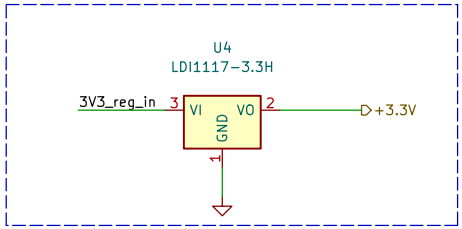


Dioda podwójna by zasilać z SC lub FC
ale mierzyć tylko napięcie FC/SC

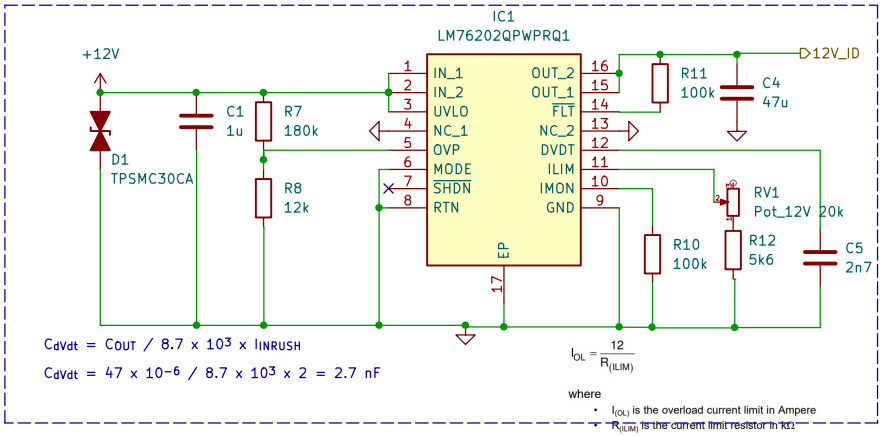
Simple LDO (+5 V)



Aditional LDO (+3.3 V)



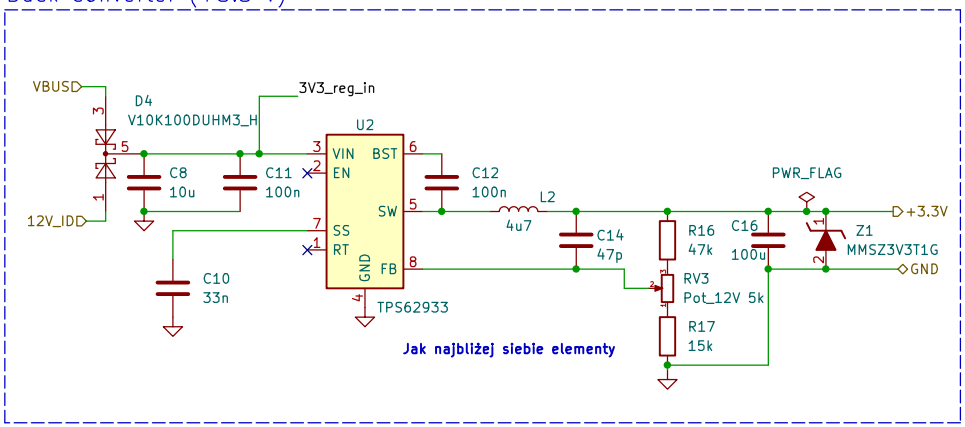
Ideal diode circuit

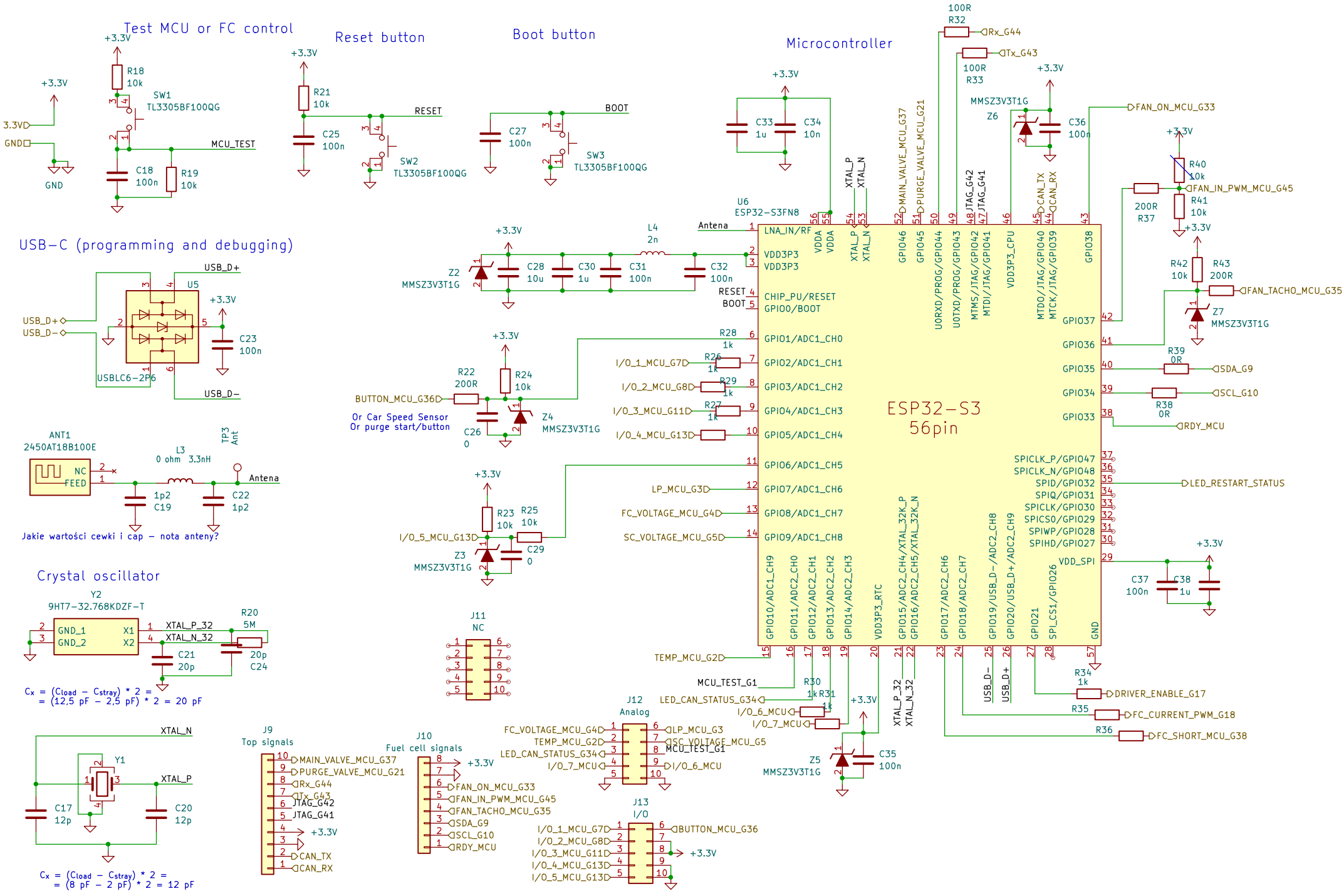


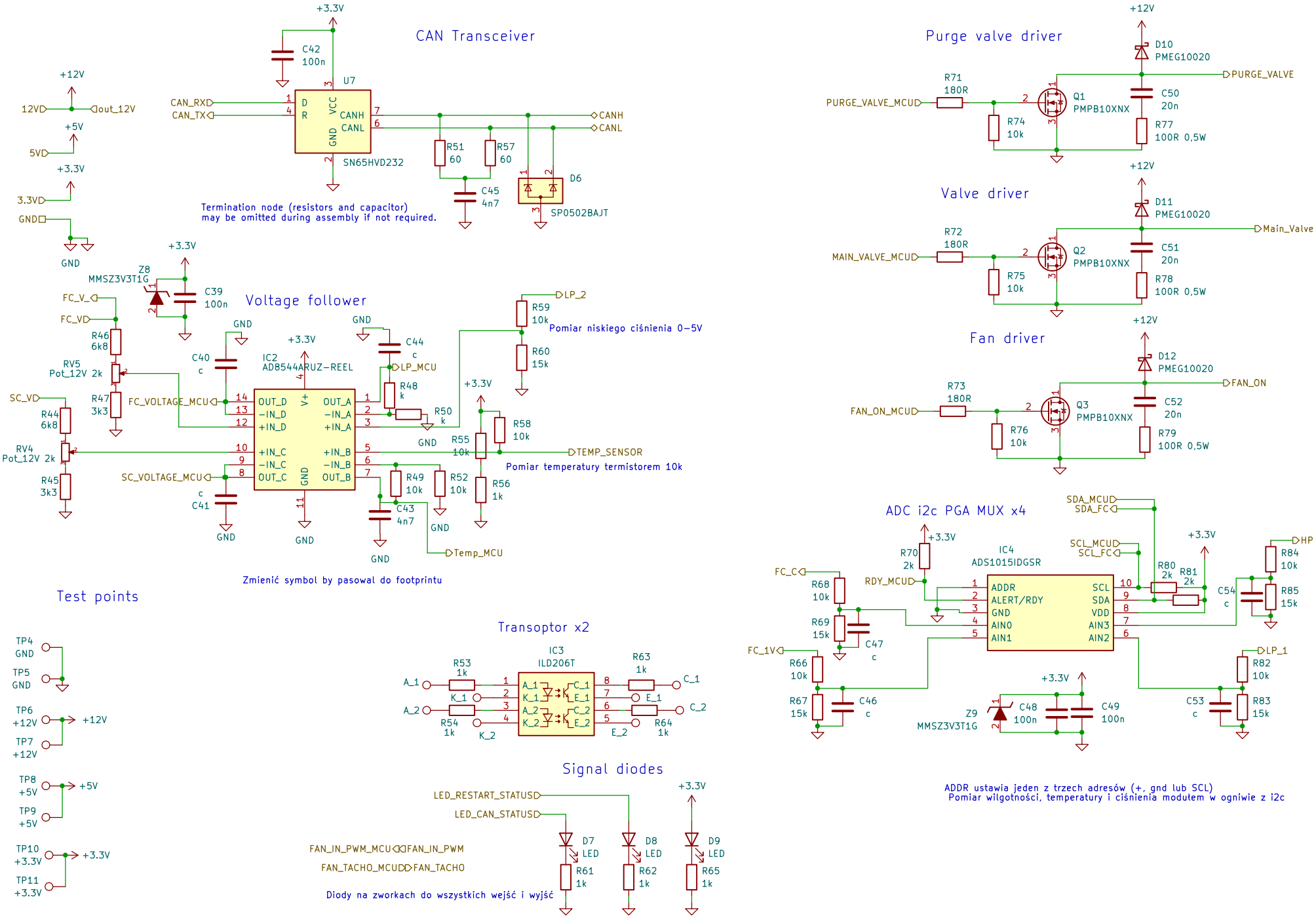
where

- $I_{(OL)}$ is the overload current limit in Ampere
- $R_{(ILIM)}$ is the current limit resistor in kΩ

Buck converter (+3.3 V)




Test MCU or FC control
Reset button
Boot button
Microcontroller
USB–C (programming and debugging)
Crystal oscillator
ESP32–S3
56pin
ESP32–S3FN8
Jakie wartości cewki i cap – nota anteny?
Cx = (Cload – Cstray) * 2 =
= (12,5 pF – 2,5 pF) * 2 = 20 pF
Cx = (Cload – Cstray) * 2 =
= (8 pF – 2 pF) * 2 = 12 pF
Or Car Speed Sensor
Or purge start/button


CAN Transceiver
+3.3V
C42
100n
U7
CAN_RX
CAN_TX
D
R
VCC
CANH
CANL
GND
SN65HVD232
CANH
CANL
R51
60
R57
60
C45
4n7
D6
SP0502BAJT
Termination node (resistors and capacitor)
may be omitted during assembly if not required.
+12V
12V
out_12V
+5V
5V
+3.3V
3.3V
GND
Purge valve driver
+12V
D10
PMEG10020
PURGE_VALVE
R71
180R
PURGE_VALVE_MCU
Q1
PMPB10XNX
C50
20n
R74
10k
R77
100R 0,5W
Valve driver
+12V
D11
PMEG10020
Main_Valve
R72
180R
MAIN_VALVE_MCU
Q2
PMPB10XNX
C51
20n
R75
10k
R78
100R 0,5W
Fan driver
+12V
D12
PMEG10020
FAN_ON
R73
180R
FAN_ON_MCU
Q3
PMPB10XNX
C52
20n
R76
10k
R79
100R 0,5W
Voltage follower
Z8
MMSZ3V3T1G
C39
100n
FC_V_
FC_V
R46
6k8
RV5
Pot_12V 2k
R47
3k3
FC_VOLTAGE_MCU
C40
c
IC2
AD8544ARUZ-REEL
OUT_D
-IN_D
+IN_D
+IN_C
-IN_C
OUT_C
V+
GND
OUT_A
-IN_A
+IN_A
+IN_B
-IN_B
OUT_B
C44
c
LP_MCU
R48
k
R50
k
LP_2
R59
10k
R60
15k
Pomiar niskiego ciśnienia 0–5V
SC_V
R44
6k8
RV4
Pot_12V 2k
R45
3k3
SC_VOLTAGE_MCU
C41
c
R55
10k
R58
10k
R56
1k
TEMP_SENSOR
Pomiar temperatury termistorem 10k
R49
10k
R52
10k
C43
4n7
Temp_MCU
Zmienić symbol by pasowal do footprintu
Test points
TP4
GND
TP5
GND
TP6
+12V
TP7
+12V
TP8
+5V
TP9
+5V
TP10
+3.3V
TP11
+3.3V
Transoptor x2
IC3
ILD206T
A_1
K_1
A_2
K_2
C_1
E_1
C_2
E_2
R53
1k
R54
1k
R63
1k
R64
1k
Signal diodes
LED_RESTART_STATUS
LED_CAN_STATUS
FAN_IN_PWM_MCU
FAN_IN_PWM
FAN_TACHO_MCU
FAN_TACHO
D7
LED
D8
LED
D9
LED
R61
1k
R62
1k
R65
1k
Diody na zworkach do wszystkich wejść i wyjść
ADC i2c PGA MUX x4
IC4
ADS1015IDGSR
ADDR
ALERT/RDY
GND
AIN0
AIN1
SCL
SDA
VDD
AIN3
AIN2
SDA_MCU
SDA_FC
SCL_MCU
SCL_FC
RDY_MCU
R70
2k
R80
2k
R81
2k
FC_C
R68
10k
R69
15k
C47
c
FC_1V
R66
10k
R67
15k
C46
c
C54
c
HP
R84
10k
R85
15k
LP_1
R82
10k
R83
15k
C53
c
Z9
MMSZ3V3T1G
C48
100n
C49
100n
ADDR ustawia jeden z trzech adresów (+, gnd lub SCL)
Pomiar wilgotności, temperatury i ciśnienia modułem w ogniwie z i2c