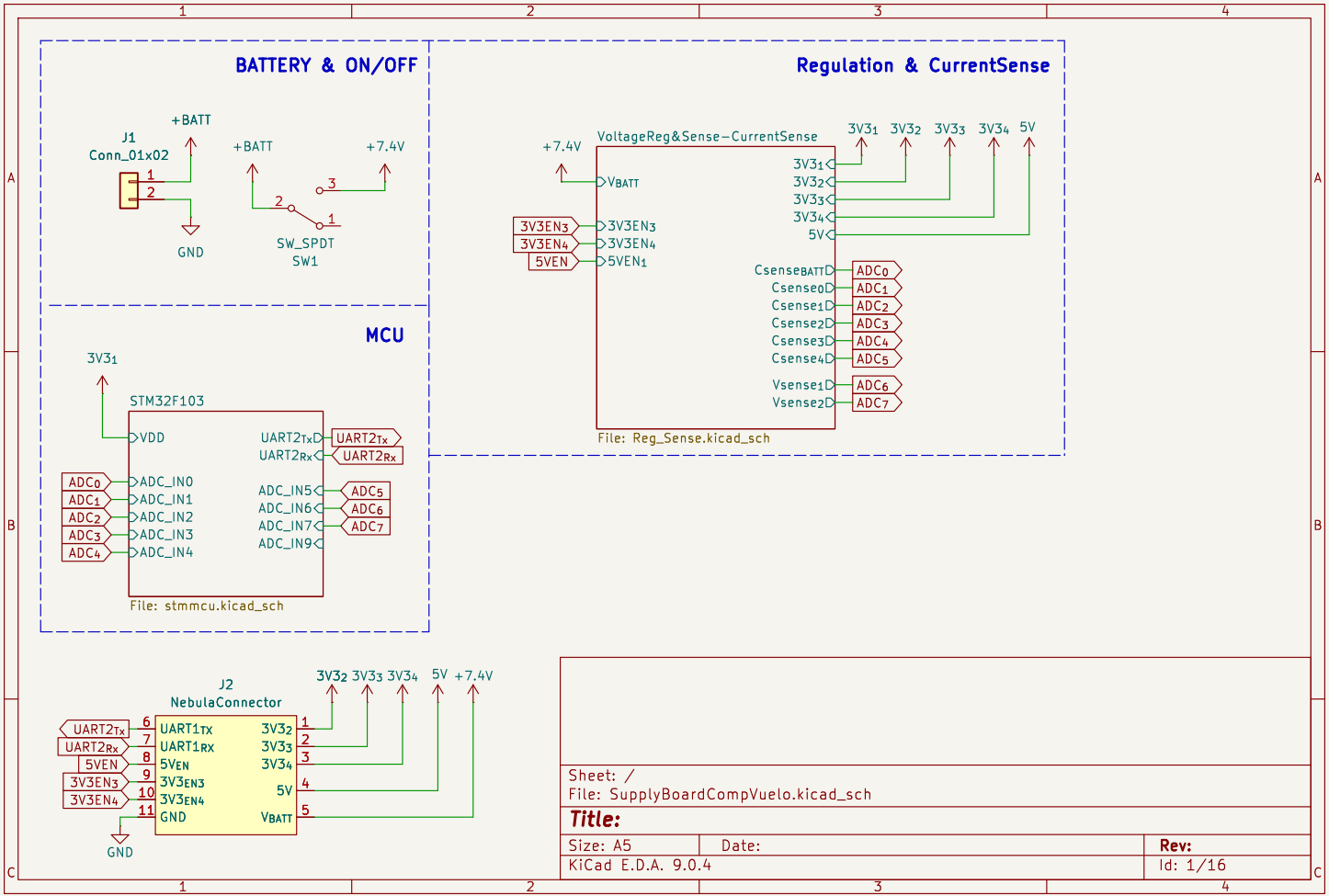
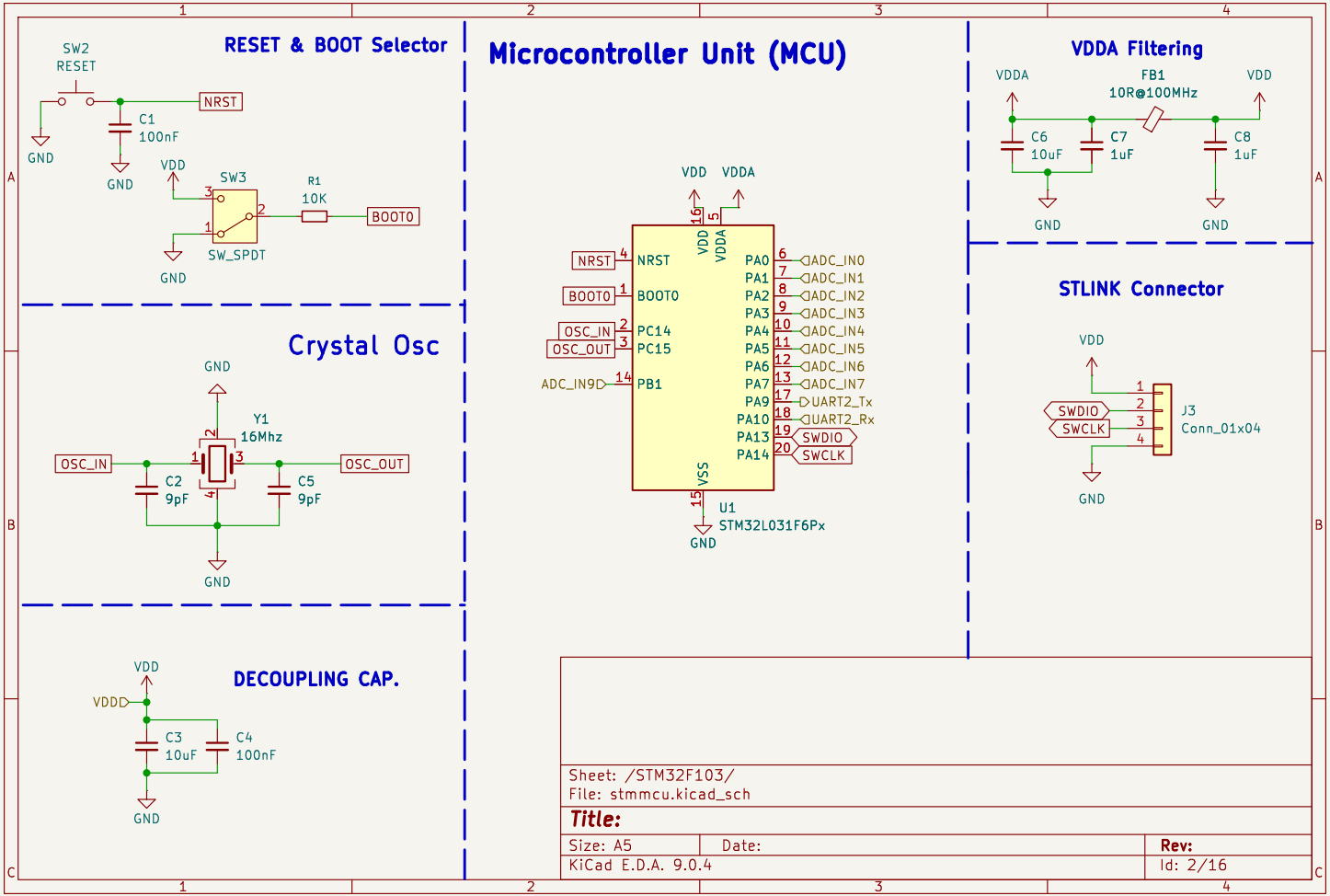
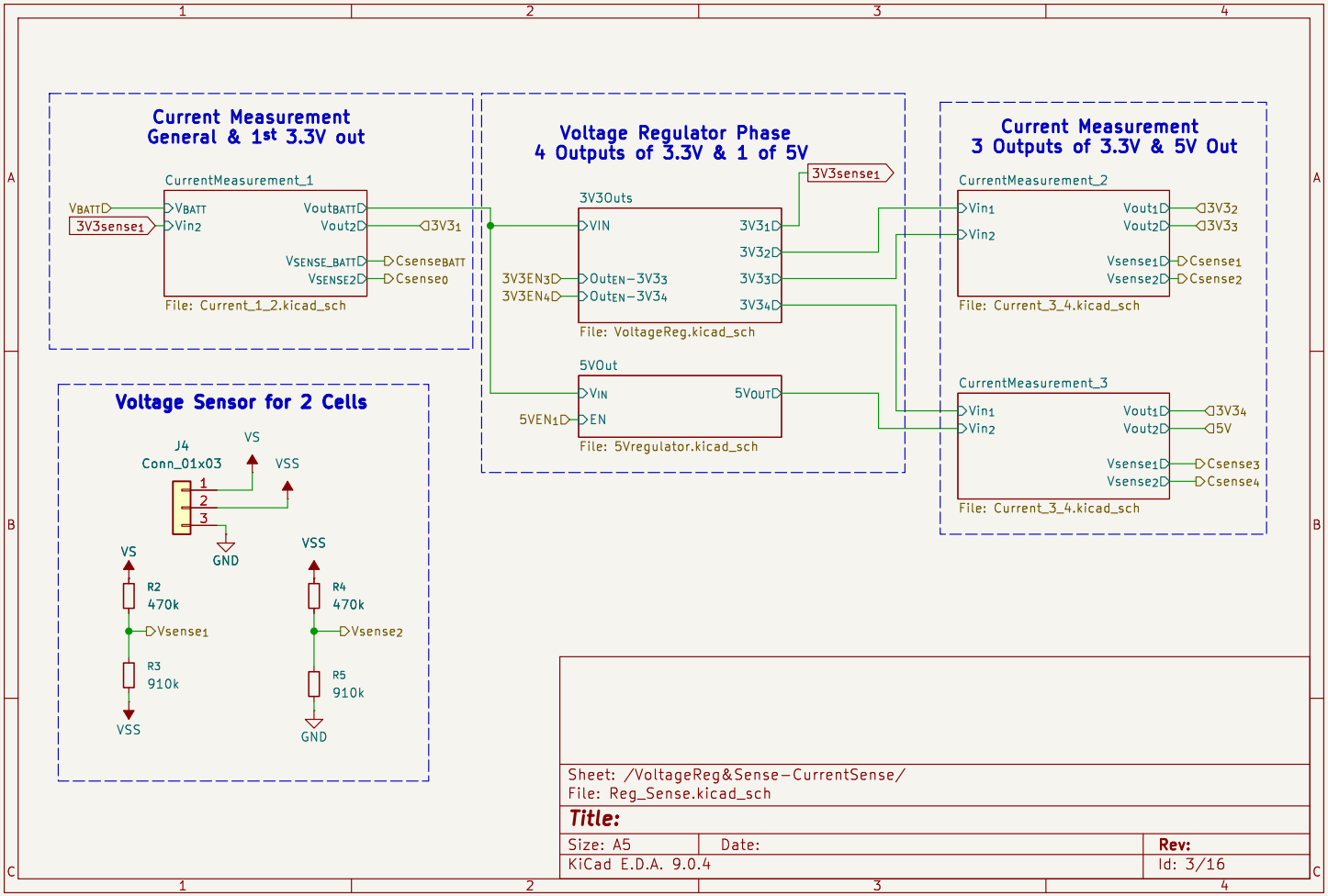
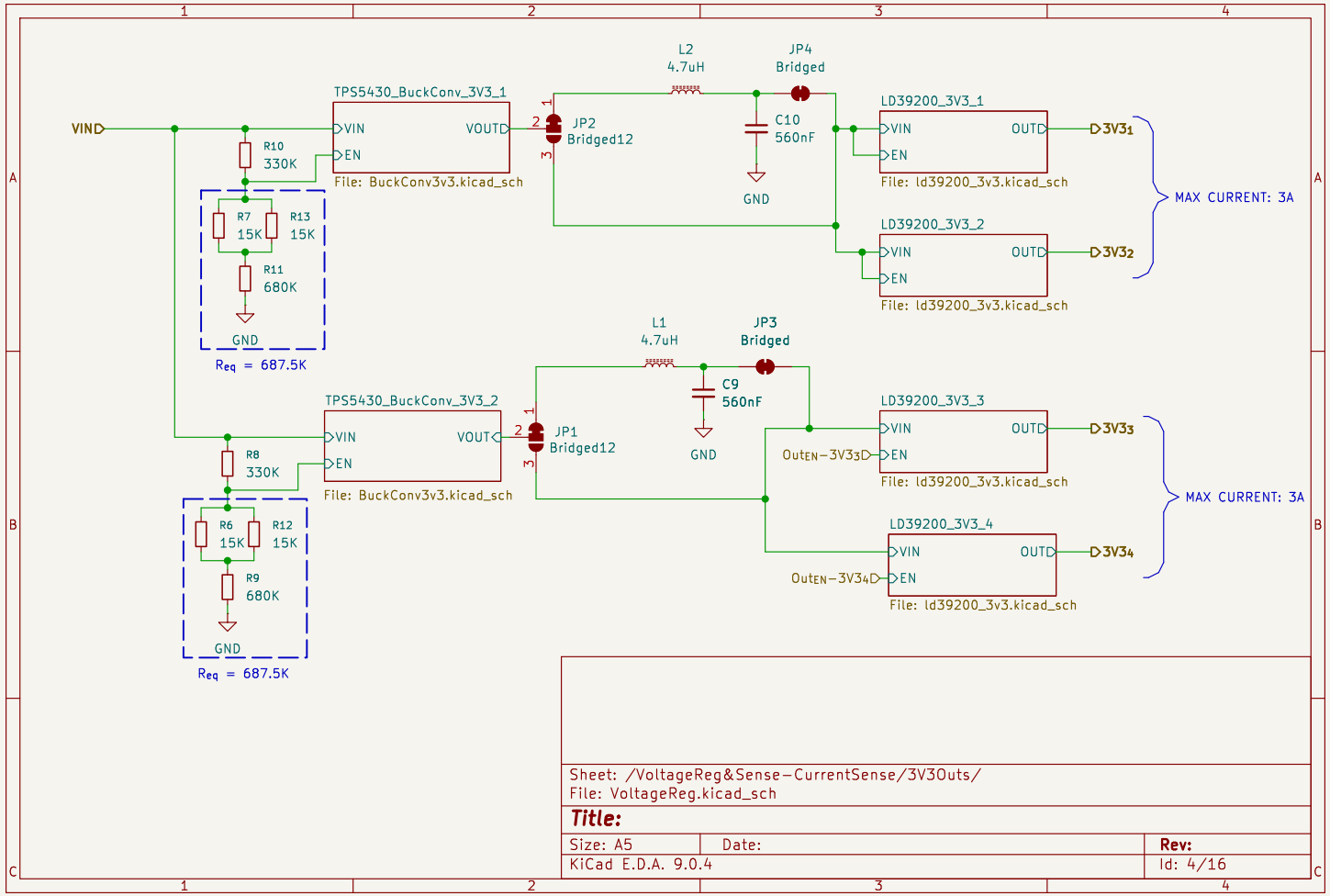
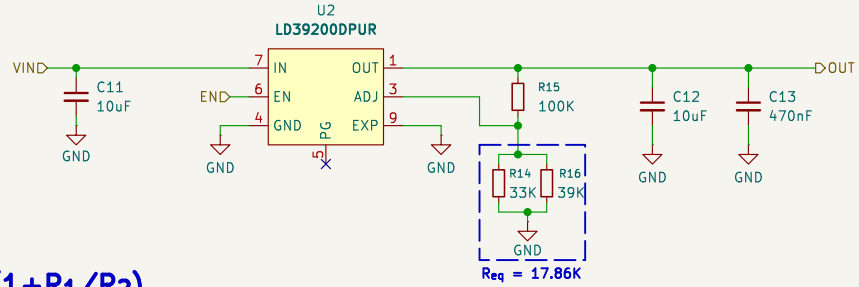

BATTERY & ON/OFF
J1
Conn_01x02
+BATT
GND
+BATT
+7.4V
SW_SPDT
SW1
Regulation & CurrentSense
+7.4V
VoltageReg&Sense-CurrentSense
3V3₁ 3V3₂ 3V3₃ 3V3₄ 5V
VBATT
3V3EN3
3V3EN4
5VEN
3V3EN3
3V3EN4
5VEN1
3V3₁
3V3₂
3V3₃
3V3₄
5V
CsenseBATT
Csense0
Csense1
Csense2
Csense3
Csense4
Vsense1
Vsense2
ADC0
ADC1
ADC2
ADC3
ADC4
ADC5
ADC6
ADC7
File: Reg_Sense.kicad_sch
MCU
3V3₁
STM32F103
VDD
UART2Tx
UART2Rx
UART2Tx
UART2Rx
ADC0
ADC1
ADC2
ADC3
ADC4
ADC_IN0
ADC_IN1
ADC_IN2
ADC_IN3
ADC_IN4
ADC_IN5
ADC_IN6
ADC_IN7
ADC_IN9
ADC5
ADC6
ADC7
File: stmmcu.kicad_sch
J2
NebulaConnector
3V3₂ 3V3₃ 3V3₄ 5V +7.4V
UART2Tx
UART2Rx
5VEN
3V3EN3
3V3EN4
GND
UART1TX
UART1RX
5VEN
3V3EN3
3V3EN4
GND
3V3₂
3V3₃
3V3₄
5V
VBATT
1
2
3
4
5
6
7
8
9
10
11
Sheet: /
File: SupplyBoardCompVuelo.kicad_sch
Title:
Size: A5
Date:
Rev:
KiCad E.D.A. 9.0.4
Id: 1/16


RESET & BOOT Selector
SW2
RESET
NRST
C1
100nF
GND
VDD
SW3
R1
10K
BOOT0
SW_SPDT
Crystal Osc
Y1
16Mhz
OSC_IN
OSC_OUT
C2
9pF
C5
9pF
DECOUPLING CAP.
C3
10uF
C4
100nF
Microcontroller Unit (MCU)
VDD
VDDA
NRST
BOOT0
PC14
PC15
PB1
ADC_IN9
PA0
PA1
PA2
PA3
PA4
PA5
PA6
PA7
PA9
PA10
PA13
PA14
ADC_IN0
ADC_IN1
ADC_IN2
ADC_IN3
ADC_IN4
ADC_IN5
ADC_IN6
ADC_IN7
UART2_Tx
UART2_Rx
SWDIO
SWCLK
VSS
U1
STM32L031F6Px
VDDA Filtering
FB1
10R@100MHz
C6
10uF
C7
1uF
C8
1uF
STLINK Connector
J3
Conn_01x04
Sheet: /STM32F103/
File: stmmcu.kicad_sch
Title:
Size: A5
Date:
Rev:
KiCad E.D.A. 9.0.4
Id: 2/16


Current Measurement
General & 1st 3.3V out
CurrentMeasurement_1
VBATT
3V3sense1
VBATT
Vin2
VoutBATT
Vout2
3V31
VSENSE_BATT
VSENSE2
CsenseBATT
Csense0
File: Current_1_2.kicad_sch
Voltage Regulator Phase
4 Outputs of 3.3V & 1 of 5V
3V3sense1
3V3Outs
VIN
3V31
3V32
3V33
3V34
3V3EN3
3V3EN4
OutEN-3V33
OutEN-3V34
File: VoltageReg.kicad_sch
5VOut
VIN
5VOUT
5VEN1
EN
File: 5Vregulator.kicad_sch
Current Measurement
3 Outputs of 3.3V & 5V Out
CurrentMeasurement_2
Vin1
Vin2
Vout1
Vout2
3V32
3V33
Vsense1
Vsense2
Csense1
Csense2
File: Current_3_4.kicad_sch
CurrentMeasurement_3
Vin1
Vin2
Vout1
Vout2
3V34
5V
Vsense1
Vsense2
Csense3
Csense4
File: Current_3_4.kicad_sch
Voltage Sensor for 2 Cells
J4
Conn_01x03
1
2
3
VS
VSS
GND
VS
R2
470k
Vsense1
R3
910k
VSS
VSS
R4
470k
Vsense2
R5
910k
GND
Sheet: /VoltageReg&Sense-CurrentSense/
File: Reg_Sense.kicad_sch
Title:
Size: A5
Date:
Rev:
KiCad E.D.A. 9.0.4
Id: 3/16


VIND
TPS5430_BuckConv_3V3_1
VIN
VOUT
EN
File: BuckConv3v3.kicad_sch
R10
330K
R7
15K
R13
15K
R11
680K
GND
Req = 687.5K
JP2
Bridged12
L2
4.7uH
JP4
Bridged
C10
560nF
GND
LD39200_3V3_1
VIN
OUT
EN
File: ld39200_3v3.kicad_sch
3V31
LD39200_3V3_2
VIN
OUT
EN
File: ld39200_3v3.kicad_sch
3V32
MAX CURRENT: 3A
L1
4.7uH
JP3
Bridged
C9
560nF
GND
TPS5430_BuckConv_3V3_2
VIN
VOUT
EN
File: BuckConv3v3.kicad_sch
JP1
Bridged12
R8
330K
R6
15K
R12
15K
R9
680K
GND
Req = 687.5K
LD39200_3V3_3
VIN
OUT
EN
OutEN-3V33
File: ld39200_3v3.kicad_sch
3V33
LD39200_3V3_4
VIN
OUT
EN
OutEN-3V34
File: ld39200_3v3.kicad_sch
3V34
MAX CURRENT: 3A
Sheet: /VoltageReg&Sense-CurrentSense/3V3Outs/
File: VoltageReg.kicad_sch
Title:
Size: A5
Date:
Rev:
KiCad E.D.A. 9.0.4
Id: 4/16



$$V_{out} = V_{adj}(1+R_1/R_2)$$

$$(V_{out}/V_{adj} - 1)R_2 = R_1$$

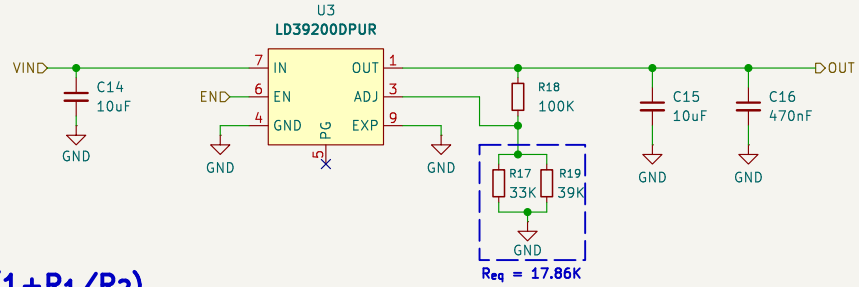
$$R_2 = R_1/(V_{out}/V_{adj} - 1)$$

Sustituyendo..

$$R_2 = 100K/(3.3/0.5 - 1)$$

$$R_2 = 17.86K$$

Sheet: /VoltageReg&Sense-CurrentSense/3V3Outs/LD39200_3V3_1/		
File: ld39200_3v3.kicad_sch		
Title:		
Size: A5	Date:	**Rev:**
KiCad E.D.A. 9.0.4		Id: 5/16



$$V_{out} = V_{adj}(1+R_1/R_2)$$

$$(V_{out}/V_{adj} - 1)R_2 = R_1$$

$$R_2 = R_1/(V_{out}/V_{adj} - 1)$$

Sustituyendo..

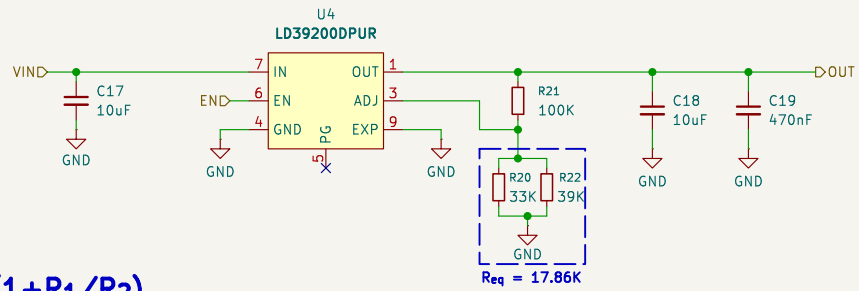
$$R_2 = 100K/(3.3/0.5 - 1)$$

$$R_2 = 17.86K$$

Sheet: /VoltageReg&Sense-CurrentSense/3V3Outs/LD39200_3V3_2/
File: ld39200_3v3.kicad_sch

Title:

Size: A5	Date:	**Rev:**
KiCad E.D.A. 9.0.4		Id: 6/16



$$V_{out} = V_{adj}(1+R_1/R_2)$$

$$(V_{out}/V_{adj} - 1)R_2 = R_1$$

$$R_2 = R_1/(V_{out}/V_{adj} - 1)$$

Sustituyendo..

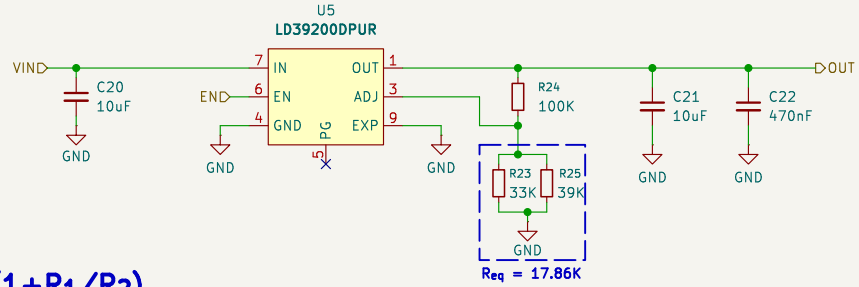
$$R_2 = 100K/(3.3/0.5 - 1)$$

$$R_2 = 17.86K$$

Sheet: /VoltageReg&Sense-CurrentSense/3V3Outs/LD39200_3V3_3/
File: ld39200_3v3.kicad_sch

Title:

Size: A5	Date:	**Rev:**
KiCad E.D.A. 9.0.4		Id: 7/16



$$V_{out} = V_{adj}(1+R_1/R_2)$$

$$(V_{out}/V_{adj} - 1)R_2 = R_1$$

$$R_2 = R_1/(V_{out}/V_{adj} - 1)$$

Sustituyendo..

$$R_2 = 100K/(3.3/0.5 - 1)$$

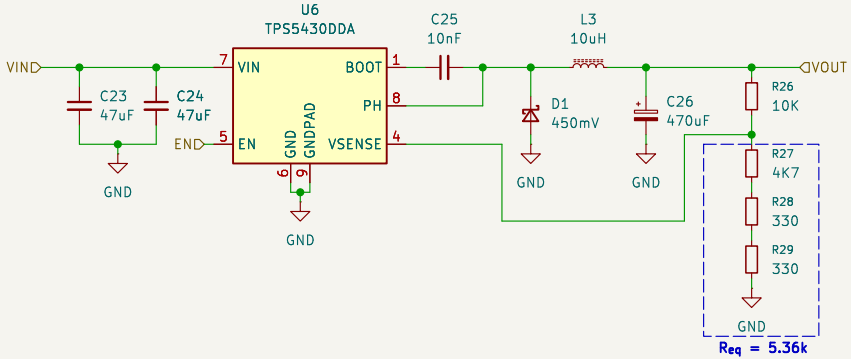
$$R_2 = 17.86K$$

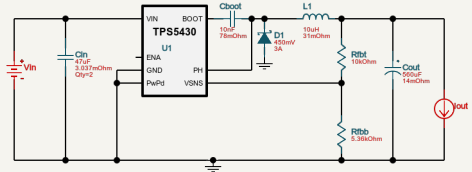
Sheet: /VoltageReg&Sense-CurrentSense/3V3Outs/LD39200_3V3_4/
File: ld39200_3v3.kicad_sch

Title:

Size: A5	Date:	**Rev:**
KiCad E.D.A. 9.0.4		Id: 8/16

VIN: 6.5V – 9V
VOUT: 3.5V
IMAX: 3A





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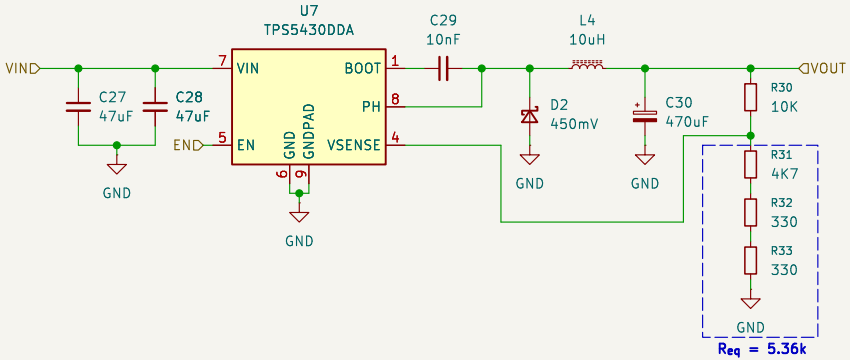
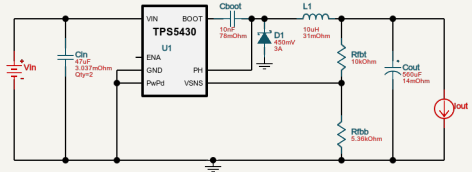
Sheet: /VoltageReg&Sense-CurrentSense/3V3Outs/TPS5430_BuckConv_3V3_1/
File: BuckConv3v3.kicad_sch

Title:

Size: A5	Date:	**Rev:**
KiCad E.D.A. 9.0.4		Id: 9/16

VIN: 6.5V – 9V
VOUT: 3.5V
IMAX: 3A





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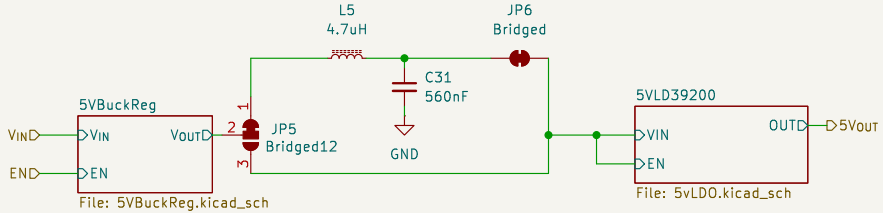
Sheet: /VoltageReg&Sense-CurrentSense/3V3Outs/TPS5430_BuckConv_3V3_2/
File: BuckConv3v3.kicad_sch

Title:

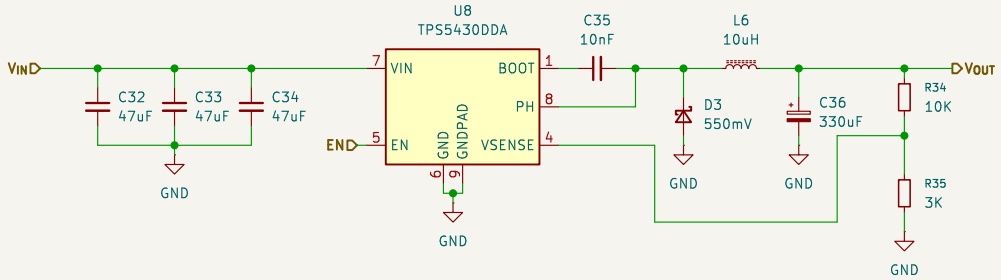
Size: A5	Date:	**Rev:**
KiCad E.D.A. 9.0.4		Id: 10/16



Sheet: /VoltageReg&Sense-CurrentSense/5VOut/
File: 5Vregulator.kicad_sch

Title:

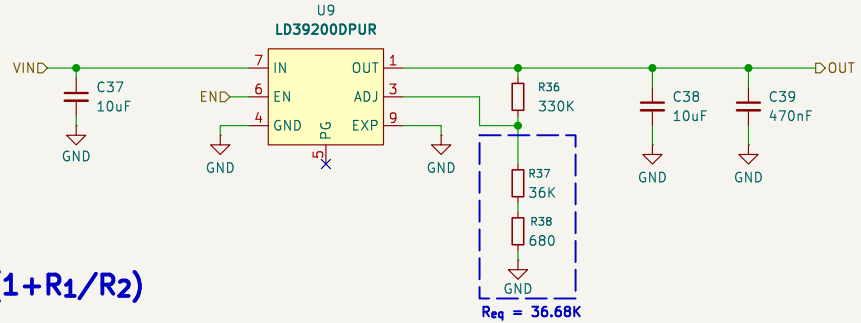
Size: A5	Date:	**Rev:**
KiCad E.D.A. 9.0.4		Id: 13/16



Sheet: /VoltageReg&Sense-CurrentSense/5VOut/5VBuckReg/
File: 5VBuckReg.kicad_sch

Title:

Size: A5	Date:	**Rev:**
KiCad E.D.A. 9.0.4		Id: 14/16



$$V_{out} = V_{adj}(1+R_1/R_2)$$

$$(V_{out}/V_{adj} - 1)R_2 = R_1$$

$$R_2 = R_1/(V_{out}/V_{adj} - 1)$$

Sustituyendo..

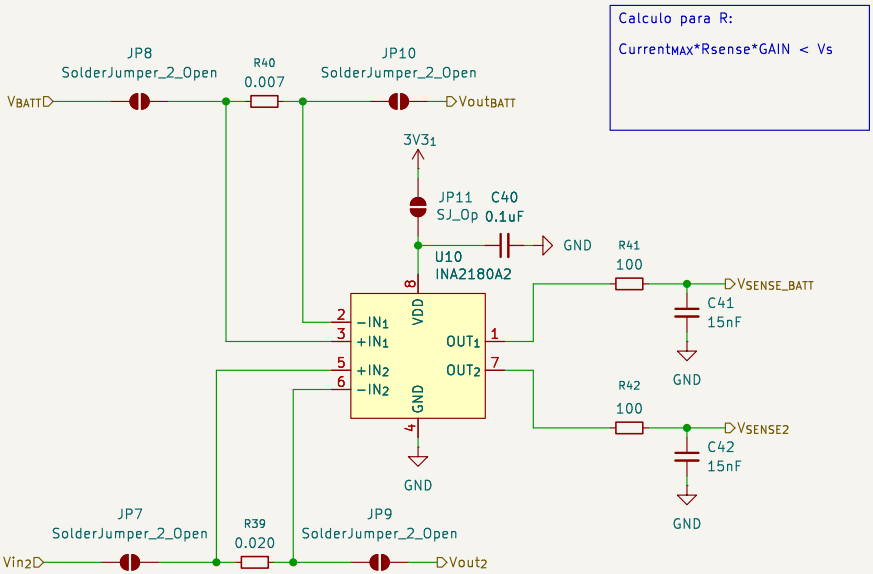
$$R_2 = 330K/(5/0.5 - 1)$$

$$R_2 = 36.66K$$

Sheet: /VoltageReg&Sense-CurrentSense/5VOut/5VLD39200/
File: 5vLDO.kicad_sch

Title:

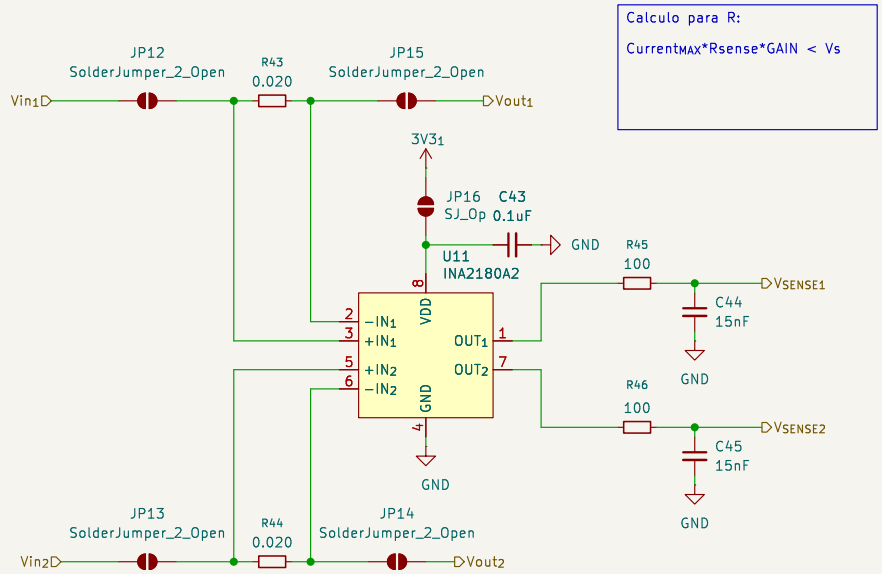
Size: A5	Date:	**Rev:**
KiCad E.D.A. 9.0.4		Id: 15/16



Sheet: /VoltageReg&Sense-CurrentSense/CurrentMeasurement_1/
File: Current_1_2.kicad_sch

Title:

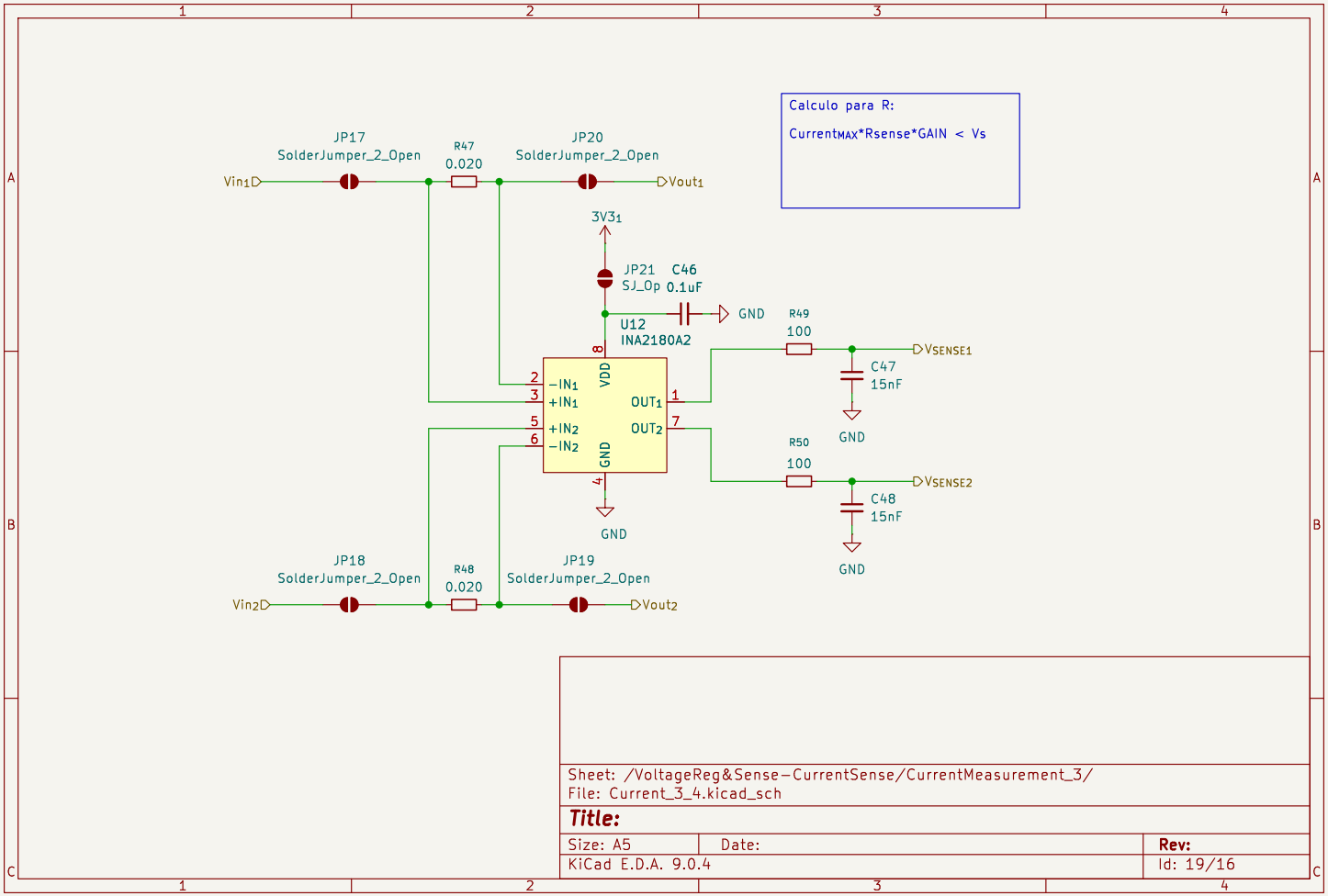
Size: A5	Date:	**Rev:**
KiCad E.D.A. 9.0.4		Id: 17/16



Sheet: /VoltageReg&Sense-CurrentSense/CurrentMeasurement_2/
File: Current_3_4.kicad_sch

Title:

Size: A5	Date:	**Rev:**
KiCad E.D.A. 9.0.4		Id: 18/16


Calculo para R:
CurrentMAX*Rsense*GAIN < Vs
JP17
SolderJumper_2_Open
R47
0.020
JP20
SolderJumper_2_Open
Vin1
Vout1
3V31
JP21
SJ_Op
C46
0.1uF
GND
U12
INA2180A2
R49
100
VSENSE1
C47
15nF
GND
R50
100
VSENSE2
C48
15nF
GND
VDD
-IN1
+IN1
+IN2
-IN2
OUT1
OUT2
GND
JP18
SolderJumper_2_Open
R48
0.020
JP19
SolderJumper_2_Open
Vin2
Vout2
Sheet: /VoltageReg&Sense-CurrentSense/CurrentMeasurement_3/
File: Current_3_4.kicad_sch
Title:
Size: A5
Date:
Rev:
KiCad E.D.A. 9.0.4
Id: 19/16