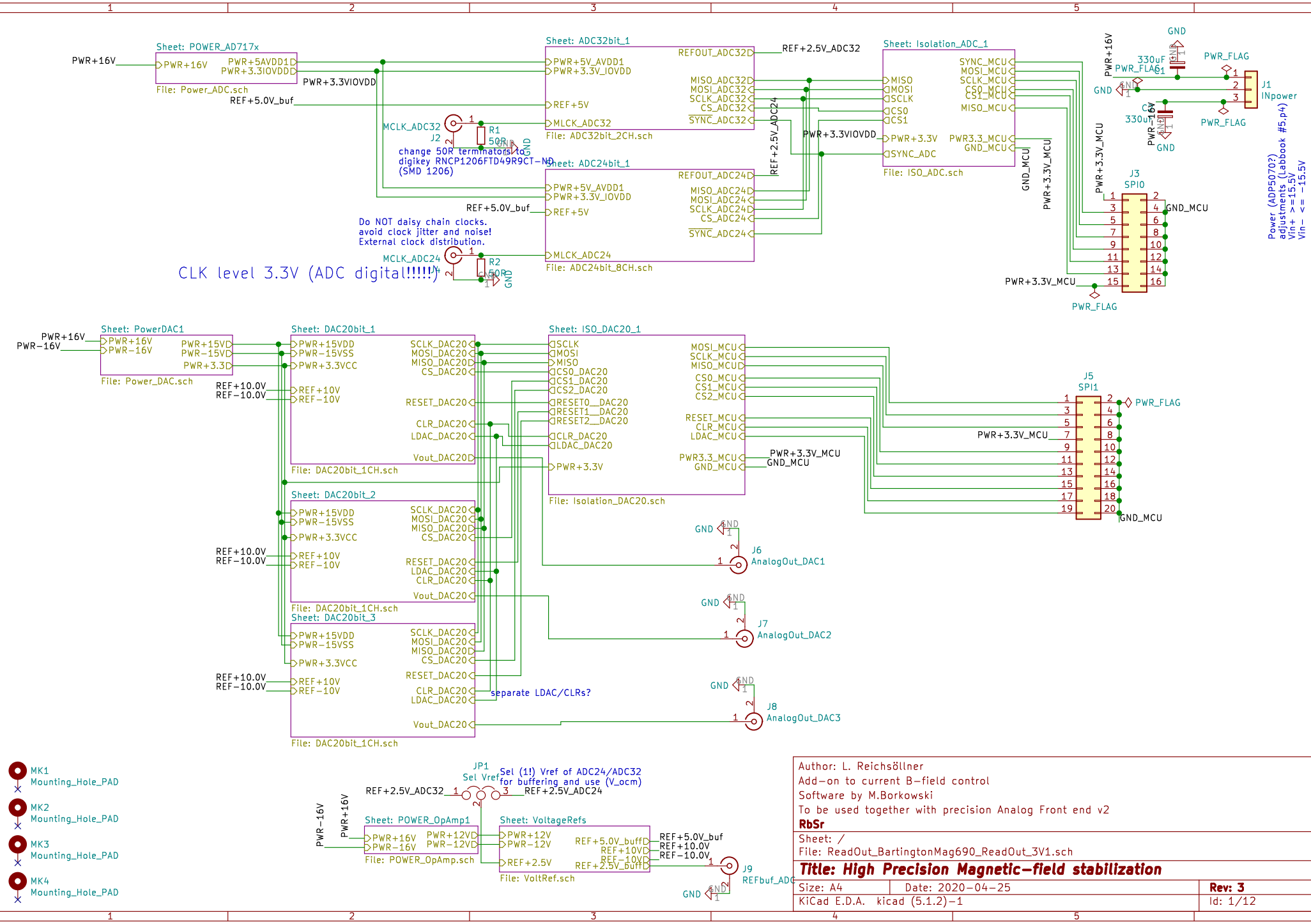
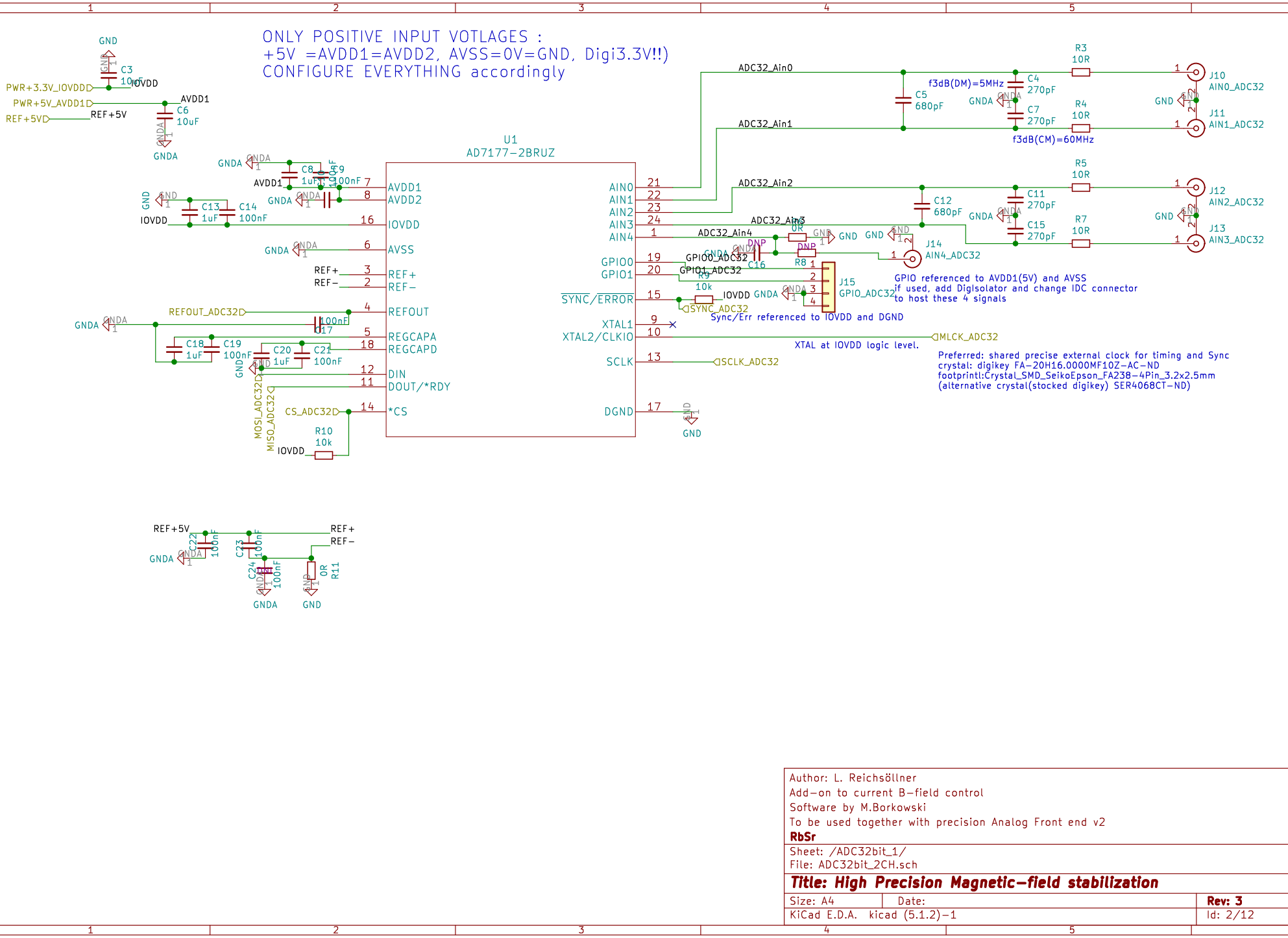
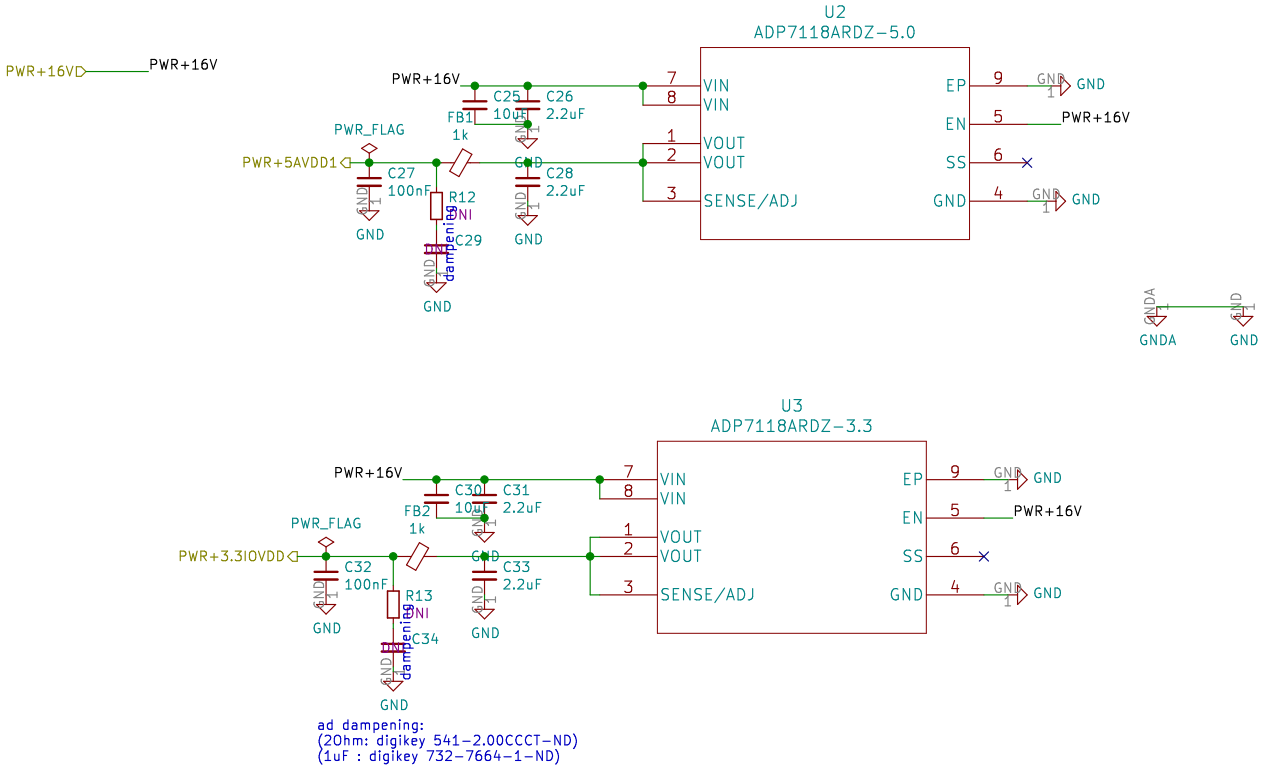
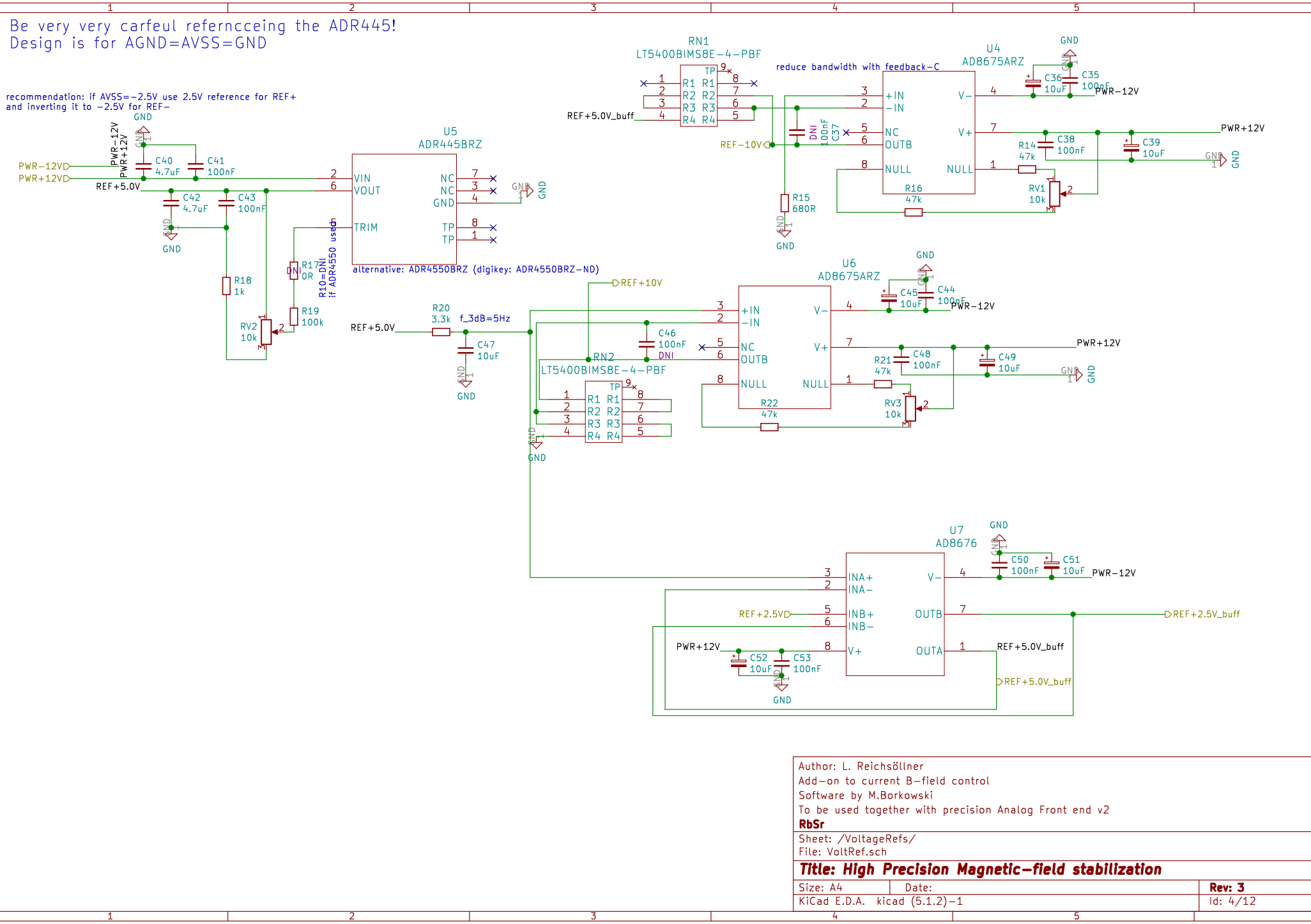

Sheet: POWER_AD717x
PWR+16V
PWR+5AVDD1
PWR+3.3IOVDD
File: Power_ADC.sch
PWR+3.3VIOVDD
REF+5.0V_buf
Sheet: ADC32bit_1
PWR+5V_AVDD1
PWR+3.3V_IOVDD
REF+5V
MLCK_ADC32
File: ADC32bit_2CH.sch
REFOUT_ADC32
MISO_ADC32
MOSI_ADC32
SCLK_ADC32
CS_ADC32
SYNC_ADC32
REF+2.5V_ADC32
MCLK_ADC32
J2
R1
50R
change 50R terminators to
digikey RNCP1206FTD49R9CT-ND
(SMD 1206)
Sheet: ADC24bit_1
PWR+5V_AVDD1
PWR+3.3V_IOVDD
REF+5V
MLCK_ADC24
File: ADC24bit_8CH.sch
REFOUT_ADC24
MISO_ADC24
MOSI_ADC24
SCLK_ADC24
CS_ADC24
SYNC_ADC24
REF+2.5V_ADC24
Do NOT daisy chain clocks.
avoid clock jitter and noise!
External clock distribution.
MCLK_ADC24
R2
50R
CLK level 3.3V (ADC digital!!!!!)
Sheet: Isolation_ADC_1
MISO
MOSI
SCLK
CS0
CS1
PWR+3.3V
SYNC_ADC
File: ISO_ADC.sch
SYNC_MCU
MOSI_MCU
SCLK_MCU
CS0_MCU
CS1_MCU
MISO_MCU
PWR3.3_MCU
GND_MCU
GND_MCU
PWR+3.3V_MCU
PWR+3.3V_MCU
PWR+16V
330uF
C1
PWR_FLAG
GND
J1
INpower
J3
SPI0
GND_MCU
PWR+3.3V_MCU
PWR_FLAG
Power (ADP50702)
adjustments (Labbook #5,p4)
Vin+ >=+15.5V
Vin- <= -15.5V
Sheet: PowerDAC1
PWR+16V
PWR-16V
PWR+15V
PWR-15V
PWR+3.3
File: Power_DAC.sch
REF+10.0V
REF-10.0V
Sheet: DAC20bit_1
PWR+15VDD
PWR-15VSS
PWR+3.3VCC
REF+10V
REF-10V
SCLK_DAC20
MOSI_DAC20
MISO_DAC20
CS_DAC20
RESET_DAC20
CLR_DAC20
LDAC_DAC20
Vout_DAC20
File: DAC20bit_1CH.sch
Sheet: DAC20bit_2
File: DAC20bit_1CH.sch
Sheet: DAC20bit_3
File: DAC20bit_1CH.sch
separate LDAC/CLRs?
Sheet: ISO_DAC20_1
SCLK
MOSI
MISO
CS0_DAC20
CS1_DAC20
CS2_DAC20
RESET0__DAC20
RESET1__DAC20
RESET2__DAC20
CLR_DAC20
LDAC_DAC20
PWR+3.3V
MOSI_MCU
SCLK_MCU
MISO_MCU
CS0_MCU
CS1_MCU
CS2_MCU
RESET_MCU
CLR_MCU
LDAC_MCU
PWR3.3_MCU
GND_MCU
File: Isolation_DAC20.sch
PWR+3.3V_MCU
GND_MCU
J5
SPI1
PWR_FLAG
PWR+3.3V_MCU
GND_MCU
J6
AnalogOut_DAC1
J7
AnalogOut_DAC2
J8
AnalogOut_DAC3
JP1
Sel Vref
Sel (1!) Vref of ADC24/ADC32
for buffering and use (V_ocm)
REF+2.5V_ADC32
REF+2.5V_ADC24
Sheet: POWER_OpAmp1
PWR+16V
PWR-16V
PWR+12V
PWR-12V
File: POWER_OpAmp.sch
Sheet: VoltageRefs
PWR+12V
PWR-12V
REF+2.5V
File: VoltRef.sch
REF+5.0V_buff
REF+10V
REF-10V
REF+2.5V_buff
REF+5.0V_buf
REF+10.0V
REF-10.0V
J9
REFbuf_ADC
MK1
Mounting_Hole_PAD
MK2
Mounting_Hole_PAD
MK3
Mounting_Hole_PAD
MK4
Mounting_Hole_PAD
Author: L. Reichsöllner
Add-on to current B-field control
Software by M.Borkowski
To be used together with precision Analog Front end v2
RbSr
Sheet: /
File: ReadOut_BartingtonMag690_ReadOut_3V1.sch
Title: High Precision Magnetic-field stabilization
Size: A4
Date: 2020-04-25
Rev: 3
KiCad E.D.A. kicad (5.1.2)-1
Id: 1/12

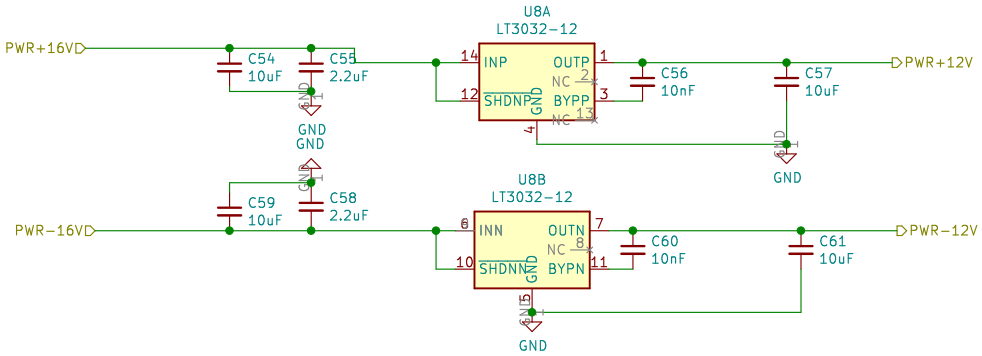

ONLY POSITIVE INPUT VOTLAGES :
+5V =AVDD1=AVDD2, AVSS=0V=GND, Digi3.3V!!)
CONFIGURE EVERYTHING accordingly
U1
AD7177-2BRUZ
AVDD1
AVDD2
IOVDD
AVSS
REF+
REF-
REFOUT
REGCAPA
REGCAPD
DIN
DOUT/*RDY
*CS
AIN0
AIN1
AIN2
AIN3
AIN4
GPIO0
GPIO1
SYNC/ERROR
XTAL1
XTAL2/CLKIO
SCLK
DGND
ADC32_Ain0
ADC32_Ain1
ADC32_Ain2
ADC32_Ain3
ADC32_Ain4
f3dB(DM)=5MHz
f3dB(CM)=60MHz
GPIO referenced to AVDD1(5V) and AVSS
if used, add DigIsolator and change IDC connector
to host these 4 signals
Sync/Err referenced to IOVDD and DGND
XTAL at IOVDD logic level.
Preferred: shared precise external clock for timing and Sync
crystal: digikey FA-20H16.0000MF10Z-AC-ND
footprintl:Crystal_SMD_SeikoEpson_FA238-4Pin_3.2x2.5mm
(alternative crystal(stocked digikey) SER4068CT-ND)
Author: L. Reichsöllner
Add-on to current B-field control
Software by M.Borkowski
To be used together with precision Analog Front end v2
RbSr
Sheet: /ADC32bit_1/
File: ADC32bit_2CH.sch
Title: High Precision Magnetic-field stabilization
Size: A4
Date:
Rev: 3
KiCad E.D.A. kicad (5.1.2)-1
Id: 2/12

AVSS power supply not implemented!!!
ASsuming AVSS=GND (=GNDA)



Author: L. Reichsöllner	
Add-on to current B-field control	
Software by M.Borkowski	
To be used together with precision Analog Front end v2	
RbSr	
Sheet: /POWER_AD717x/	
File: Power_ADC.sch	
Title: High Precision Magnetic-field stabilization	
Size: A4	Date: **Rev: 3**
KiCad E.D.A. kicad (5.1.2)-1	Id: 3/12


Be very very carfeul refernccеing the ADR445!
Design is for AGND=AVSS=GND
recommendation: if AVSS=−2.5V use 2.5V reference for REF+
and inverting it to −2.5V for REF−
PWR−12V
PWR+12V
REF+5.0V
GND
C40 4.7uF
C41 100nF
C42 4.7uF
C43 100nF
R18 1k
RV2 10k
R19 100k
R17 0R
DNI
R10=DNI if ADR4550 used
U5
ADR445BRZ
VIN
VOUT
TRIM
NC
NC
GND
TP
TP
alternative: ADR4550BRZ (digikey: ADR4550BRZ−ND)
R20 3.3k
f_3dB=5Hz
C47 10uF
REF+10V
RN1
LT5400BIMS8E−4−PBF
RN2
LT5400BIMS8E−4−PBF
C46 100nF
DNI
REF+5.0V_buff
REF−10V
C37 100nF
DNI
R15 680R
U4
AD8675ARZ
reduce bandwidth with feedback−C
+IN
−IN
NC
OUTB
NULL
V−
V+
R16 47k
R14 47k
RV1 10k
C36 10uF
C35 100nF
C38 100nF
C39 10uF
PWR−12V
PWR+12V
U6
AD8675ARZ
C45 10uF
C44 100nF
C48 100nF
C49 10uF
R21 47k
R22 47k
RV3 10k
U7
AD8676
INA+
INA−
INB+
INB−
OUTA
OUTB
REF+2.5V
REF+2.5V_buff
REF+5.0V_buff
C50 100nF
C51 10uF
C52 10uF
C53 100nF
Author: L. Reichsöllner
Add−on to current B−field control
Software by M.Borkowski
To be used together with precision Analog Front end v2
RbSr
Sheet: /VoltageRefs/
File: VoltRef.sch
Title: High Precision Magnetic−field stabilization
Size: A4
Date:
Rev: 3
KiCad E.D.A. kicad (5.1.2)−1
Id: 4/12

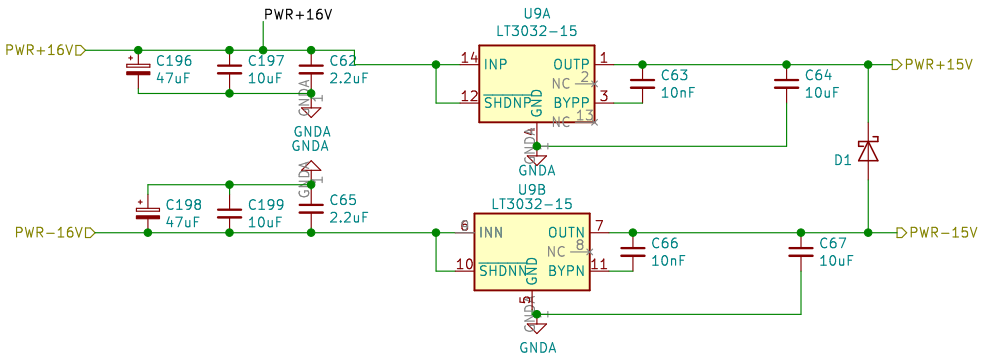


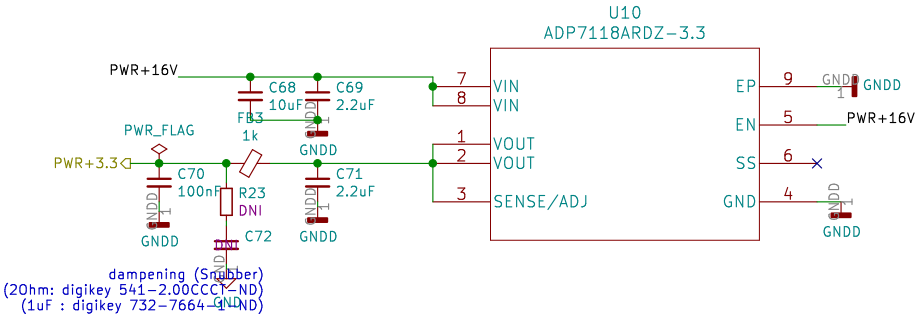
Author: L. Reichsöllner
Add-on to current B-field control
Software by M.Borkowski
To be used together with precision Analog Front end v2
RbSr

Sheet: /POWER_OpAmp1/
File: POWER_OpAmp.sch

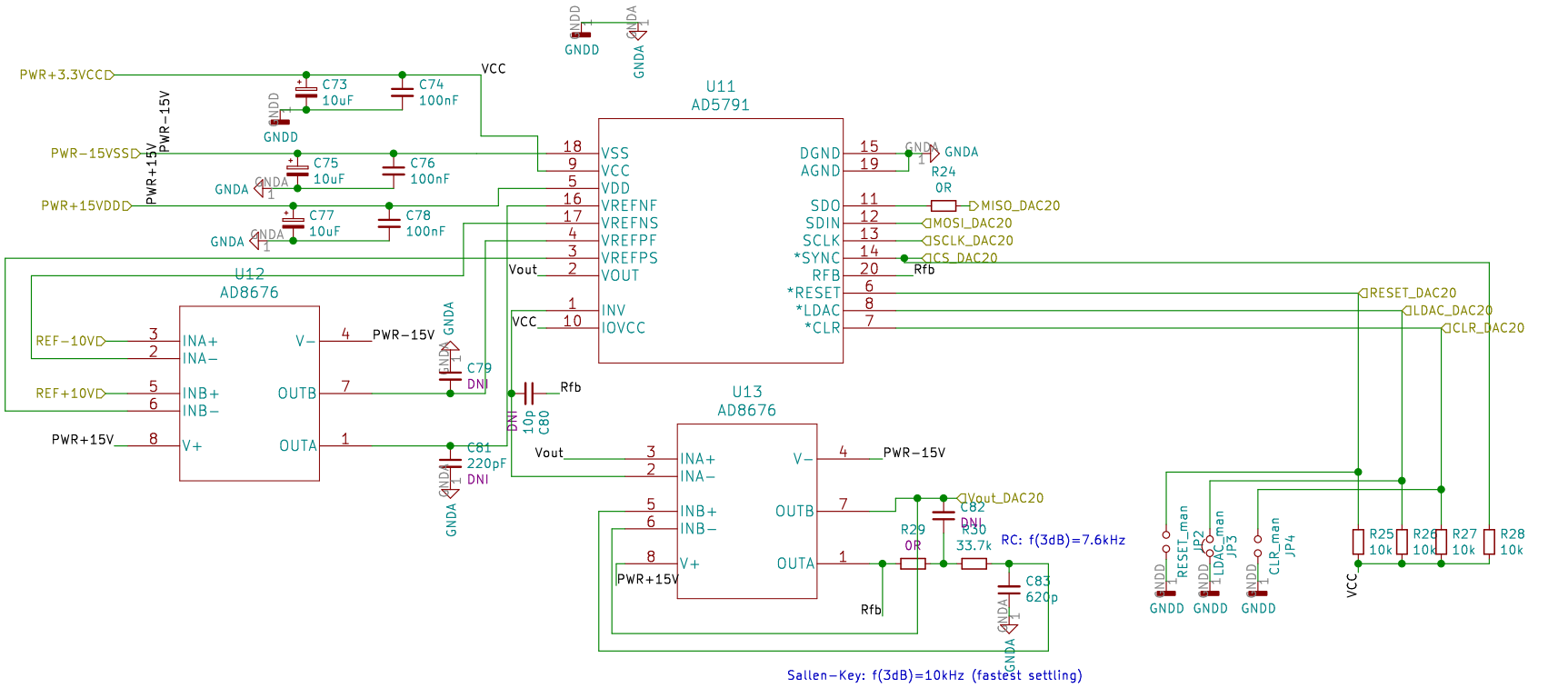
Title: High Precision Magnetic-field stabilization

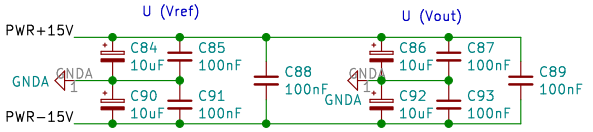
Size: A4	Date:	**Rev: 3**
KiCad E.D.A. kicad (5.1.2)-1		Id: 5/12





Author: L. Reichsöllner	
Add-on to current B-field control	
Software by M.Borkowski	
To be used together with precision Analog Front end v2	
RbSr	
Sheet: /PowerDAC1/	
File: Power_DAC.sch	
Title: High Precision Magnetic-field stabilization	
Size: A4	Date: **Rev: 3**
KiCad E.D.A. kicad (5.1.2)-1	Id: 6/12



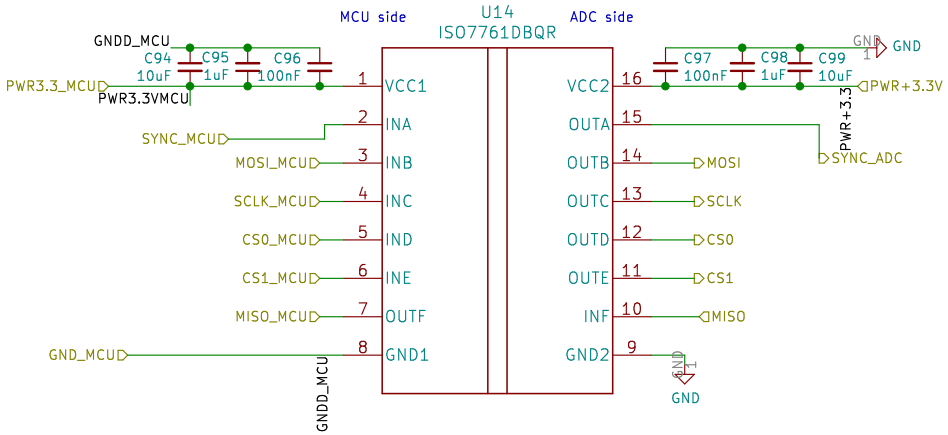


Author: L. Reichsöllner
Add-on to current B-field control
Software by M.Borkowski
To be used together with precision Analog Front end v2
RbSr

Sheet: /DAC20bit_1/
File: DAC20bit_1CH.sch

Title: High Precision Magnetic-field stabilization

Size: A4	Date:	**Rev: 3**
KiCad E.D.A. kicad (5.1.2)-1		Id: 7/12

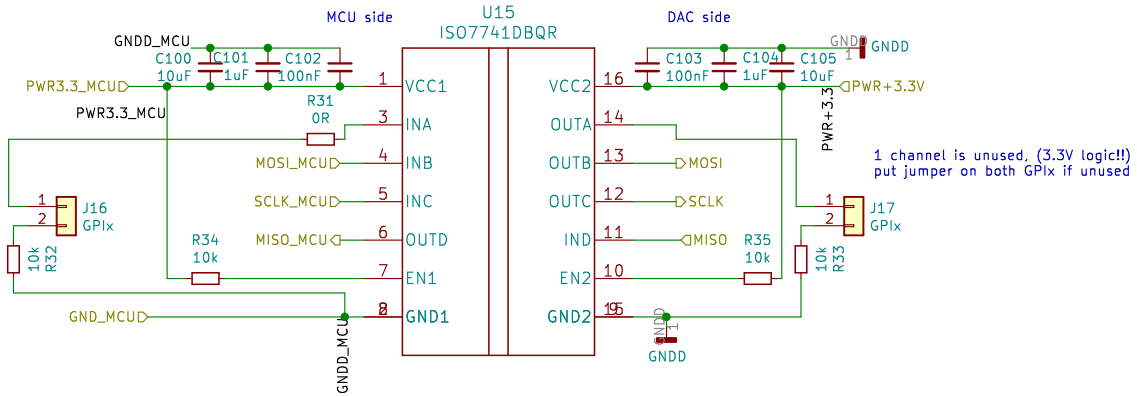


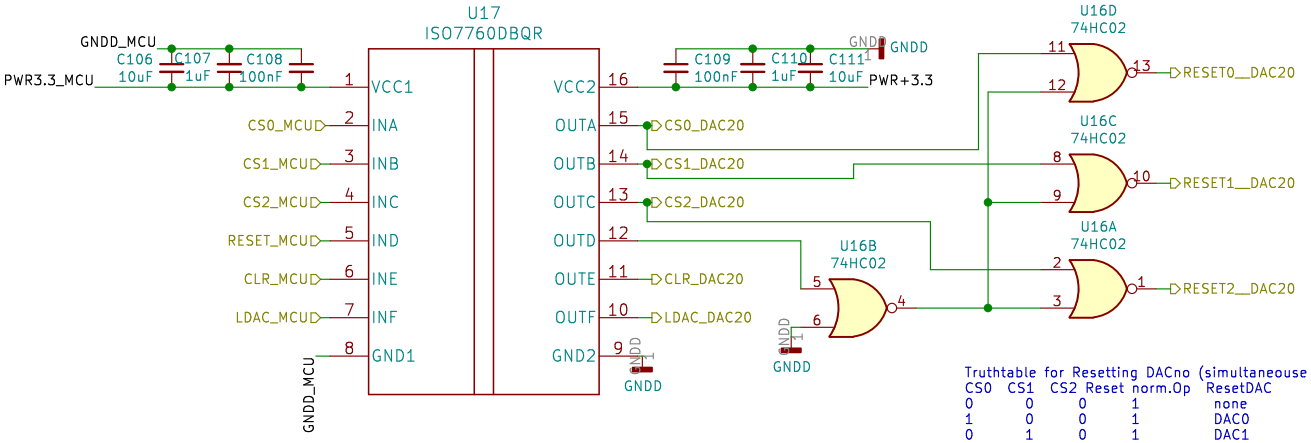
Author: L. Reichsöllner
Add-on to current B-field control
Software by M.Borkowski
To be used together with precision Analog Front end v2
RbSr

Sheet: /Isolation_ADC_1/
File: ISO_ADC.sch

Title: High Precision Magnetic-field stabilization

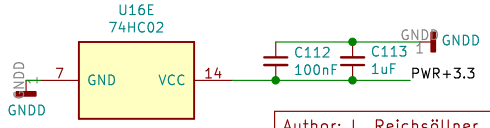
Size: A4	Date:	**Rev: 3**
KiCad E.D.A. kicad (5.1.2)-1		Id: 8/12





Truthtable for Resetting DACno (simultaneouse reset no possible!)

CS0	CS1	CS2	Reset	norm.Op	ResetDAC	
0	0	0	1	none		none
1	0	0	1	DAC0		none
0	1	0	1	DAC1		none
0	0	1	1	DAC2		none
0	0	0	0	none		none
1	0	0	0	none		DAC0
0	1	0	0	none		DAC1
0	0	1	0	none		DAC2

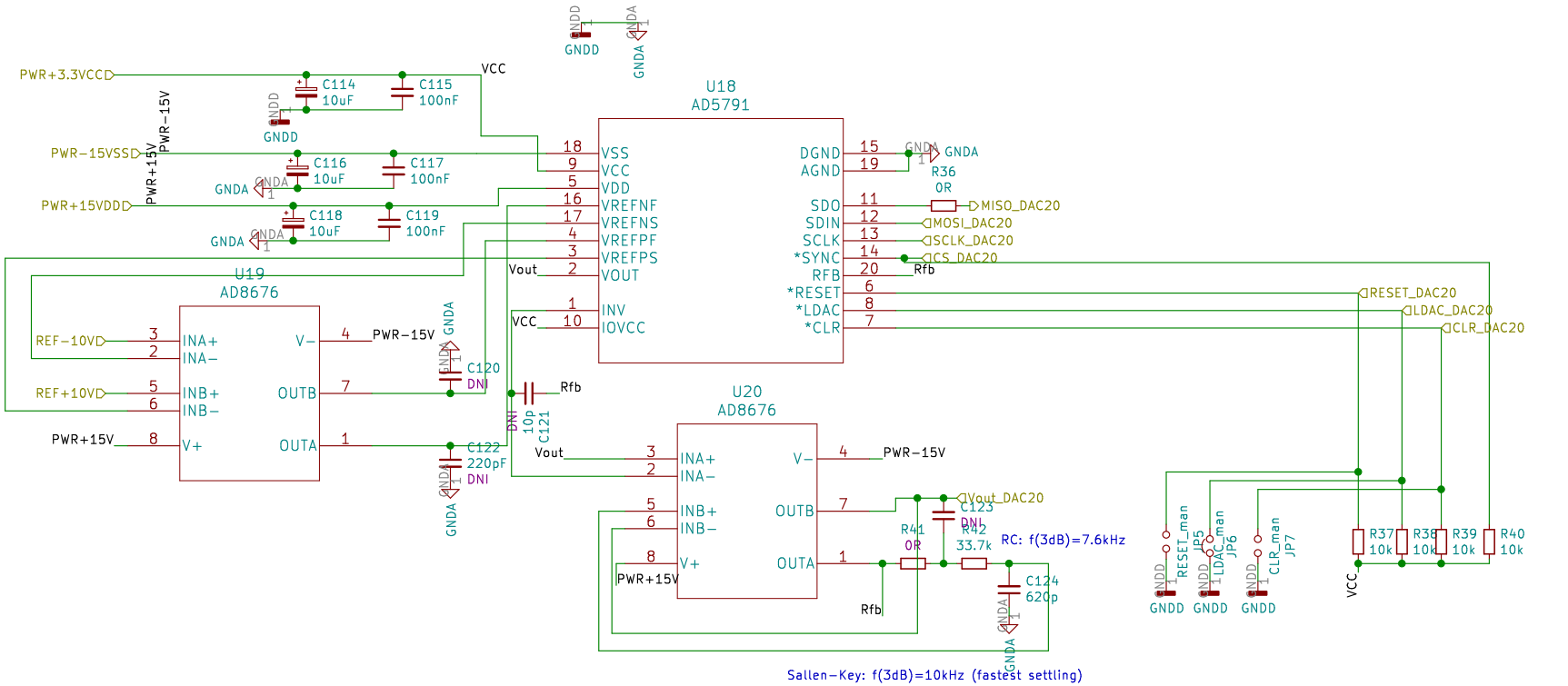


Author: L. Reichsöllner
Add-on to current B-field control
Software by M.Borkowski
To be used together with precision Analog Front end v2
RbSr

Sheet: /ISO_DAC20_1/
File: Isolation_DAC20.sch

Title: High Precision Magnetic-field stabilization

Size: A4	Date:	**Rev: 3**
KiCad E.D.A. kicad (5.1.2)-1		Id: 9/12

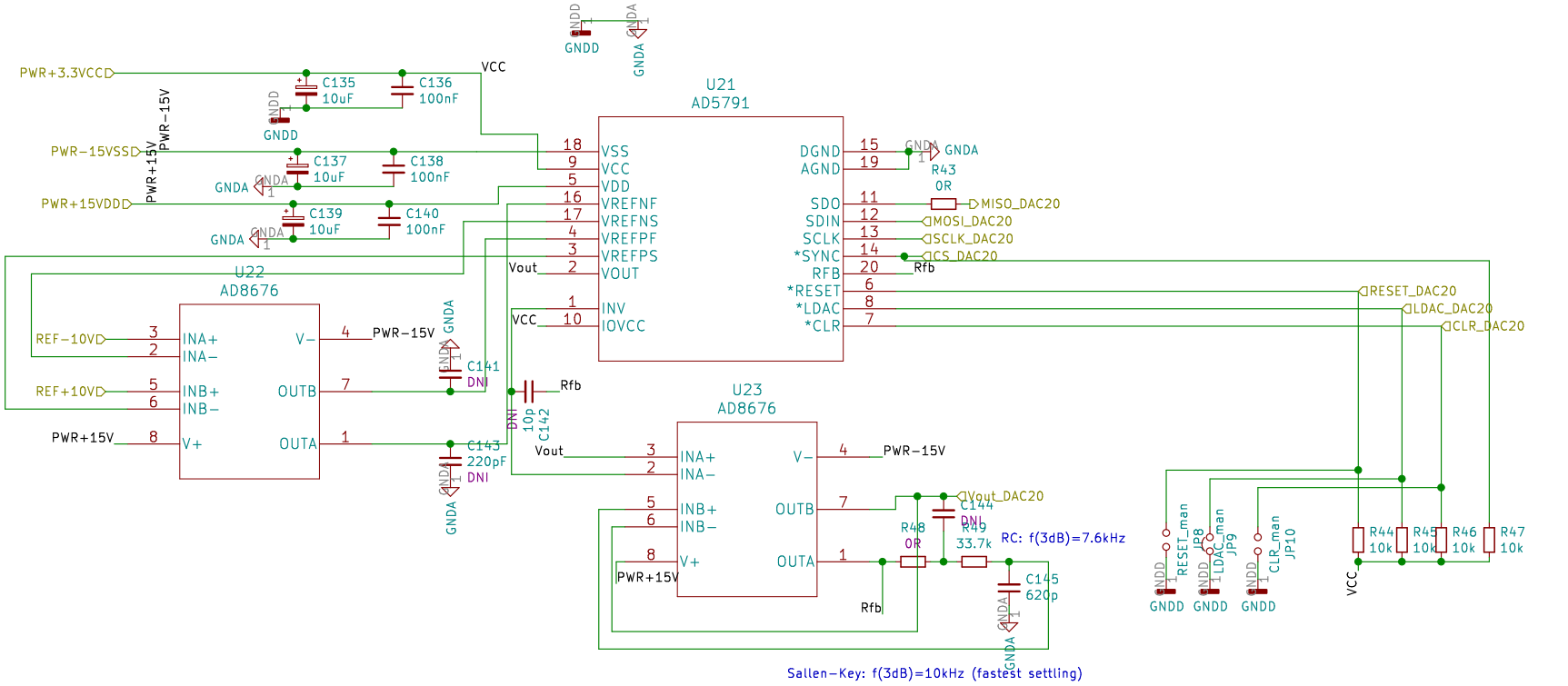


Author: L. Reichsöllner
Add-on to current B-field control
Software by M.Borkowski
To be used together with precision Analog Front end v2
RbSr

Sheet: /DAC20bit_2/
File: DAC20bit_1CH.sch

Title: High Precision Magnetic-field stabilization

Size: A4	Date:	**Rev: 3**
KiCad E.D.A. kicad (5.1.2)-1		Id: 10/12

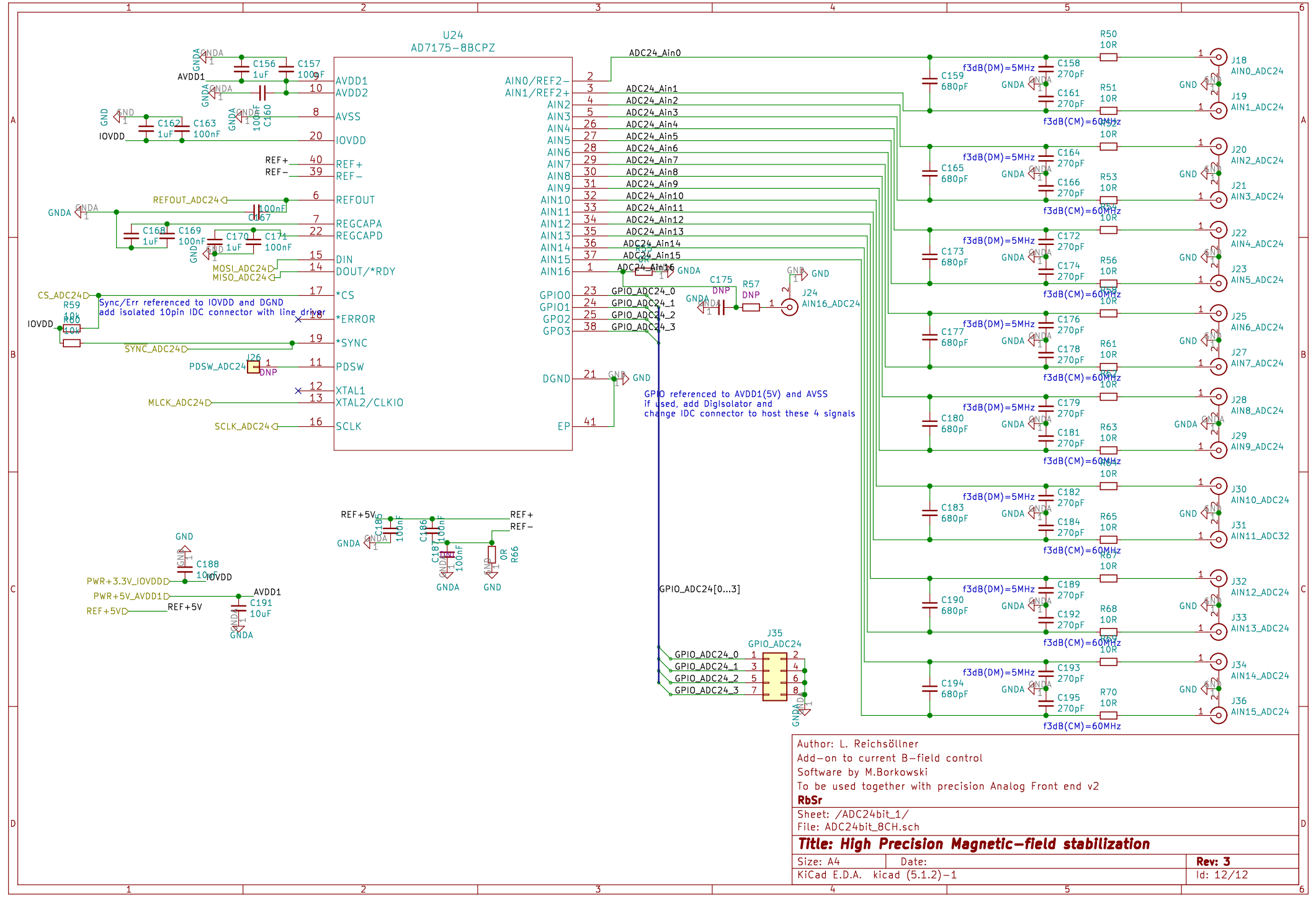


Author: L. Reichsöllner
Add-on to current B-field control
Software by M.Borkowski
To be used together with precision Analog Front end v2
RbSr

Sheet: /DAC20bit_3/
File: DAC20bit_1CH.sch

Title: High Precision Magnetic-field stabilization

Size: A4	Date:	**Rev: 3**
KiCad E.D.A. kicad (5.1.2)-1		Id: 11/12


U24
AD7175-8BCPZ
AVDD1
AVDD2
AVSS
IOVDD
REF+
REF-
REFOUT
REGCAPA
REGCAPD
DIN
DOUT/*RDY
*CS
*ERROR
*SYNC
PDSW
XTAL1
XTAL2/CLKIO
SCLK
AIN0/REF2-
AIN1/REF2+
AIN2
AIN3
AIN4
AIN5
AIN6
AIN7
AIN8
AIN9
AIN10
AIN11
AIN12
AIN13
AIN14
AIN15
AIN16
GPIO0
GPIO1
GPO2
GPO3
DGND
EP
ADC24_Ain0
ADC24_Ain1
ADC24_Ain2
ADC24_Ain3
ADC24_Ain4
ADC24_Ain5
ADC24_Ain6
ADC24_Ain7
ADC24_Ain8
ADC24_Ain9
ADC24_Ain10
ADC24_Ain11
ADC24_Ain12
ADC24_Ain13
ADC24_Ain14
ADC24_Ain15
ADC24_Ain16
GPIO_ADC24_0
GPIO_ADC24_1
GPIO_ADC24_2
GPIO_ADC24_3
REFOUT_ADC24
MOSI_ADC24
MISO_ADC24
CS_ADC24
SYNC_ADC24
PDSW_ADC24
MLCK_ADC24
SCLK_ADC24
Sync/Err referenced to IOVDD and DGND
add isolated 10pin IDC connector with line driver
GPIO referenced to AVDD1(5V) and AVSS
if used, add DigIsolator and
change IDC connector to host these 4 signals
GPIO_ADC24[0...3]
J35
GPIO_ADC24
J18 AIN0_ADC24
J19 AIN1_ADC24
J20 AIN2_ADC24
J21 AIN3_ADC24
J22 AIN4_ADC24
J23 AIN5_ADC24
J25 AIN6_ADC24
J27 AIN7_ADC24
J28 AIN8_ADC24
J29 AIN9_ADC24
J30 AIN10_ADC24
J31 AIN11_ADC32
J32 AIN12_ADC24
J33 AIN13_ADC24
J34 AIN14_ADC24
J36 AIN15_ADC24
J24 AIN16_ADC24
f3dB(DM)=5MHz
f3dB(CM)=60MHz
PWR+3.3V_IOVDD
PWR+5V_AVDD1
REF+5V
Author: L. Reichsöllner
Add-on to current B-field control
Software by M.Borkowski
To be used together with precision Analog Front end v2
RbSr
Sheet: /ADC24bit_1/
File: ADC24bit_8CH.sch
Title: High Precision Magnetic-field stabilization
Size: A4
Date:
Rev: 3
KiCad E.D.A. kicad (5.1.2)-1
Id: 12/12