

Sheet: /dac_gp1/howland_ipump/
File: howland_ipump.sch

Title:

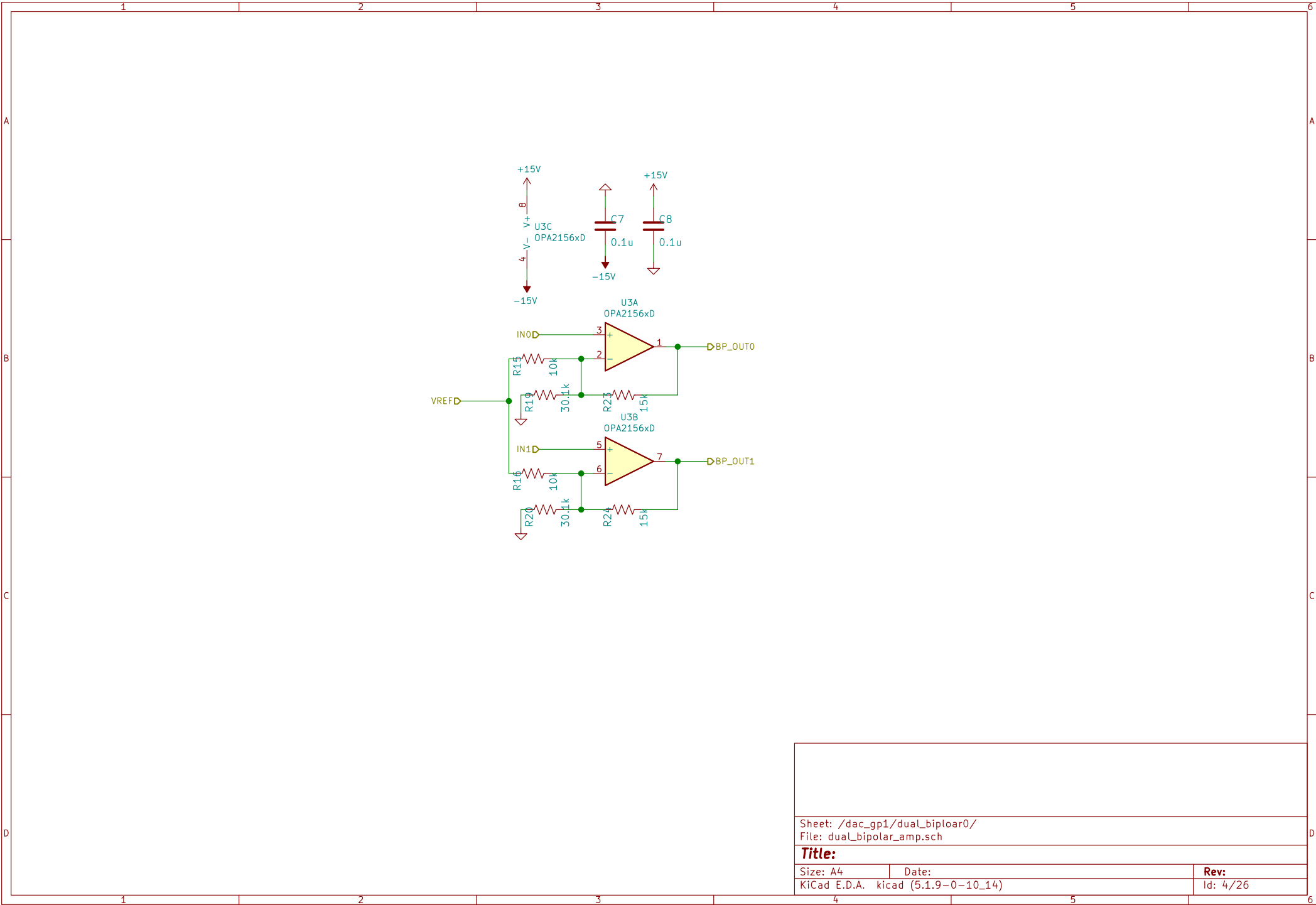
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Sheet: /dac_gp1/dual_biploar0/
File: dual_bipolar_amp.sch

Title:

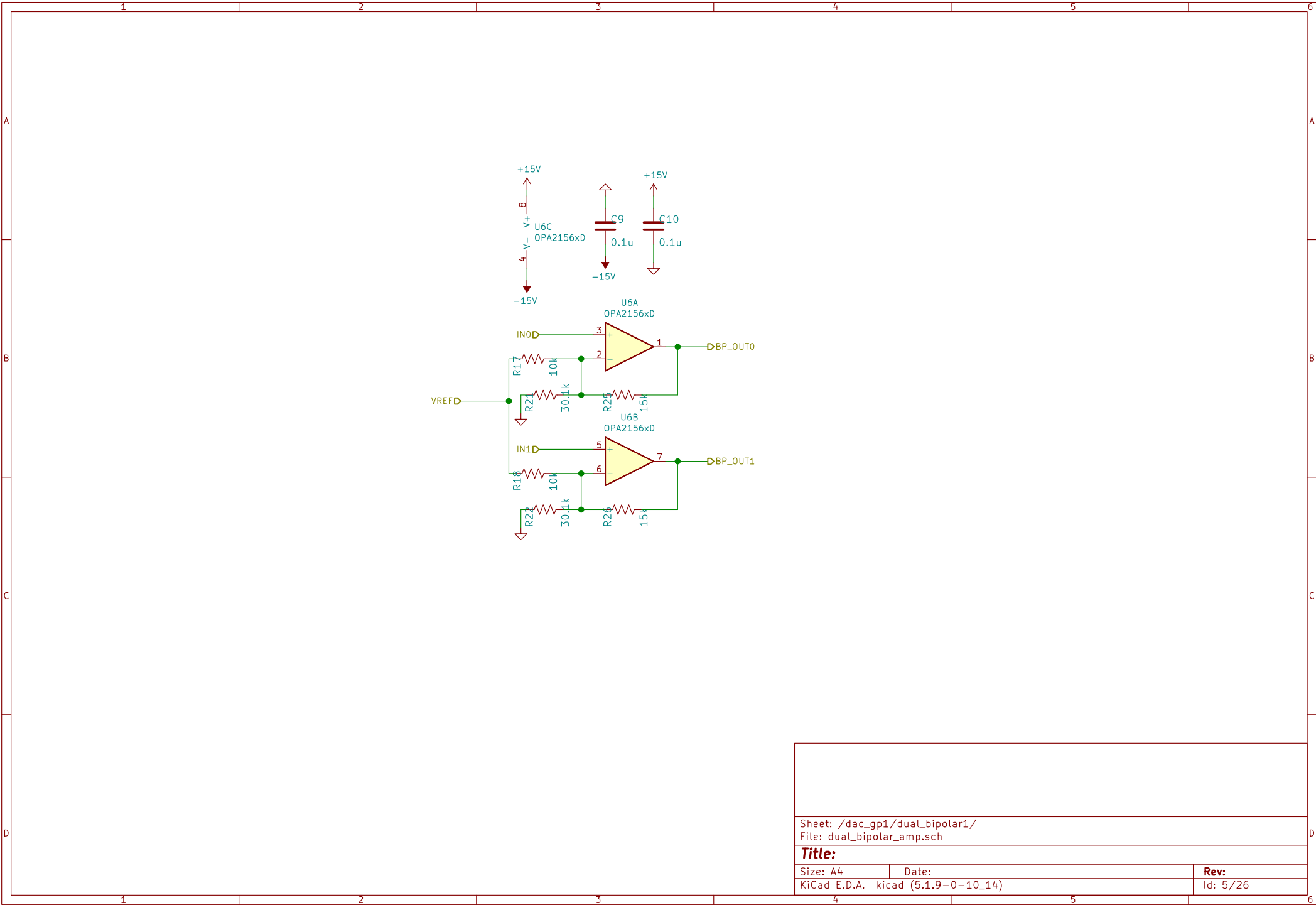
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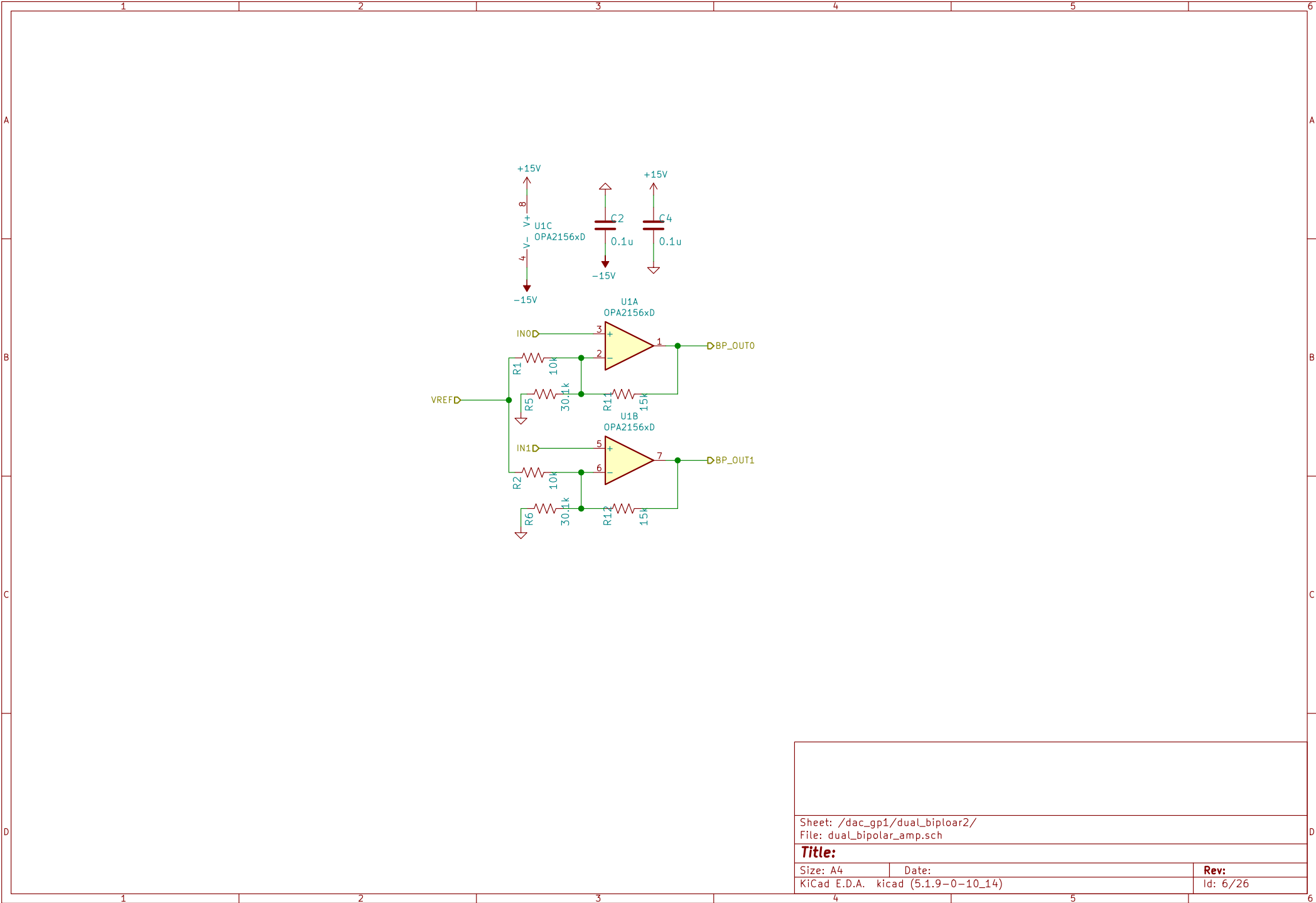
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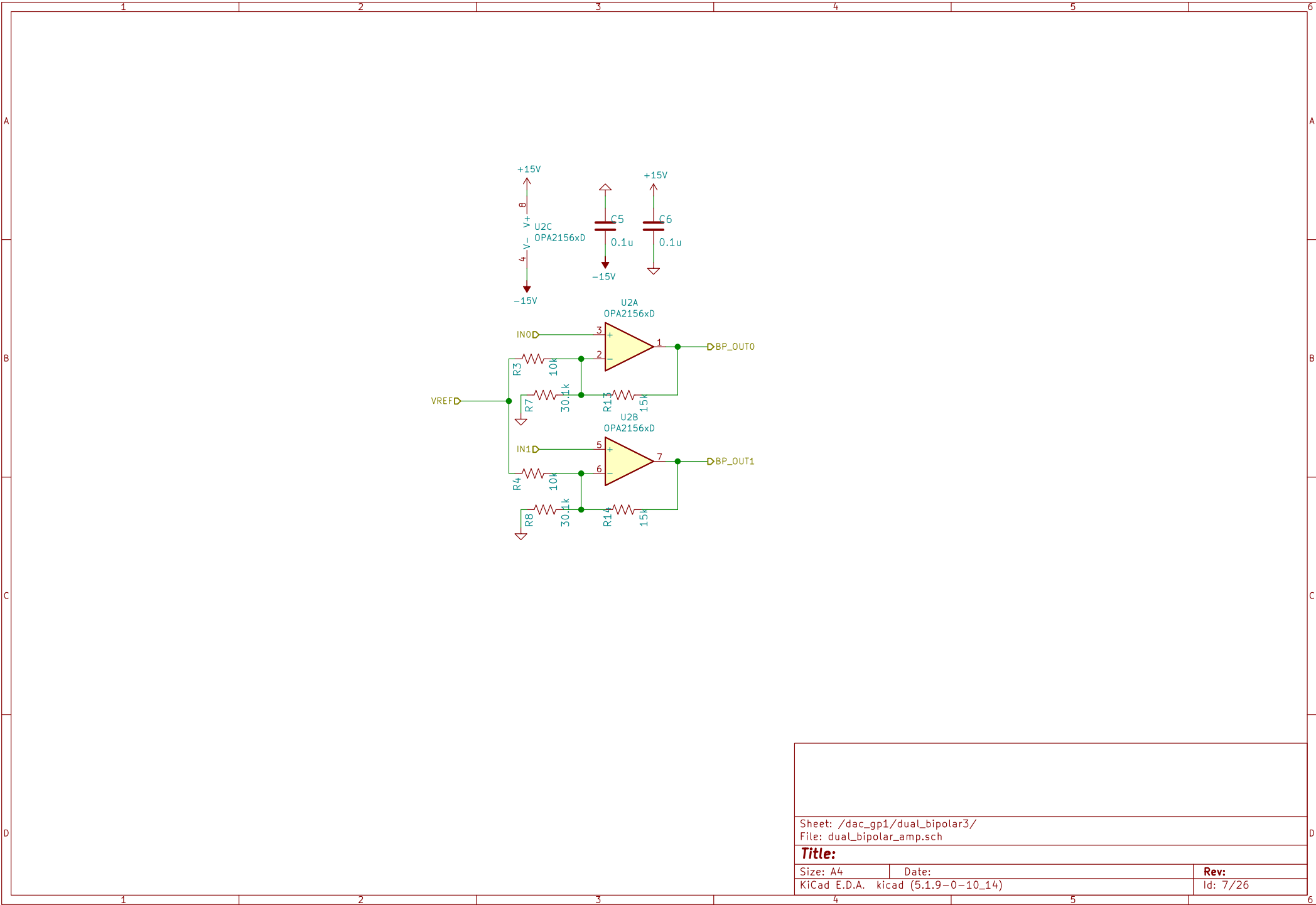
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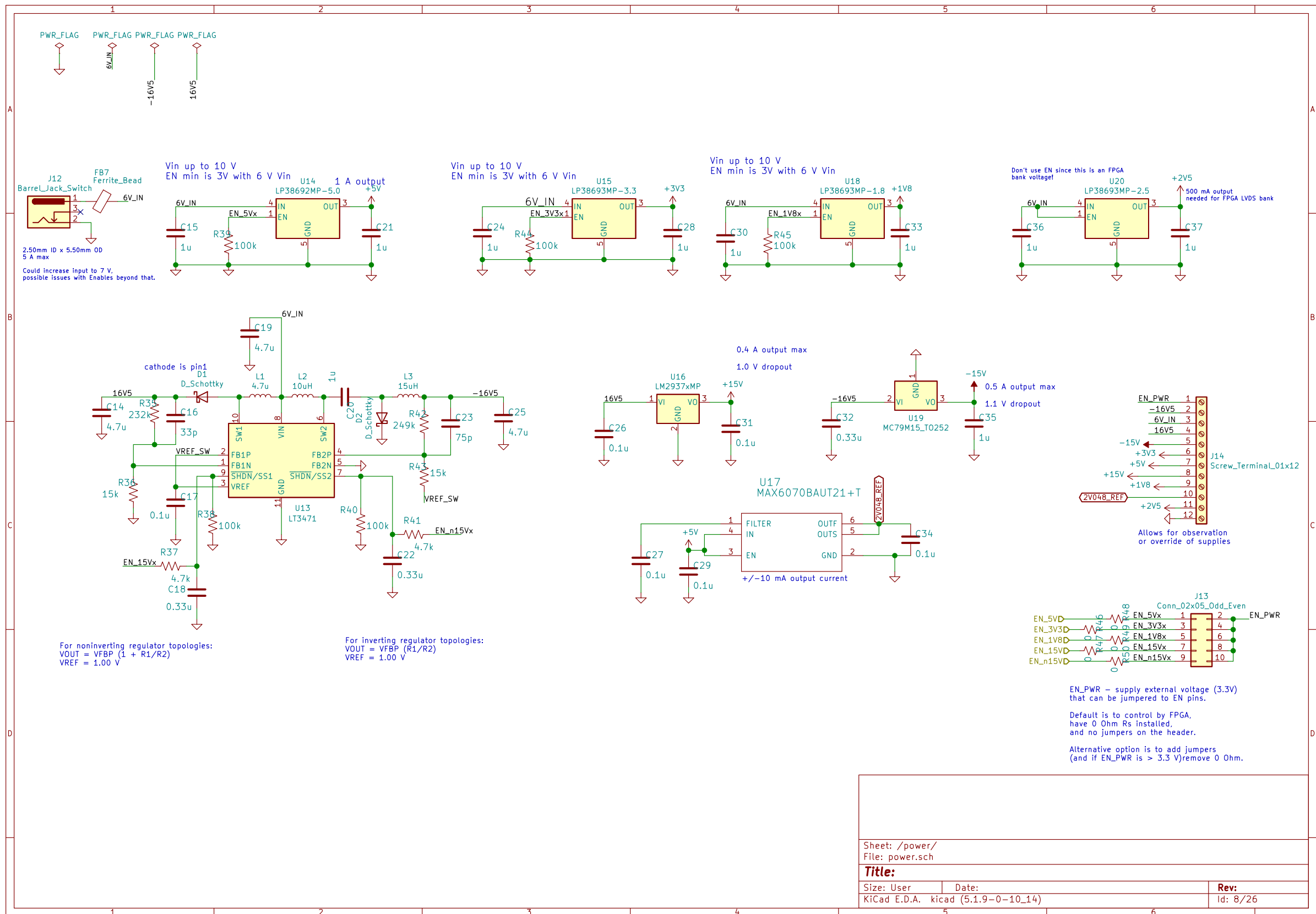
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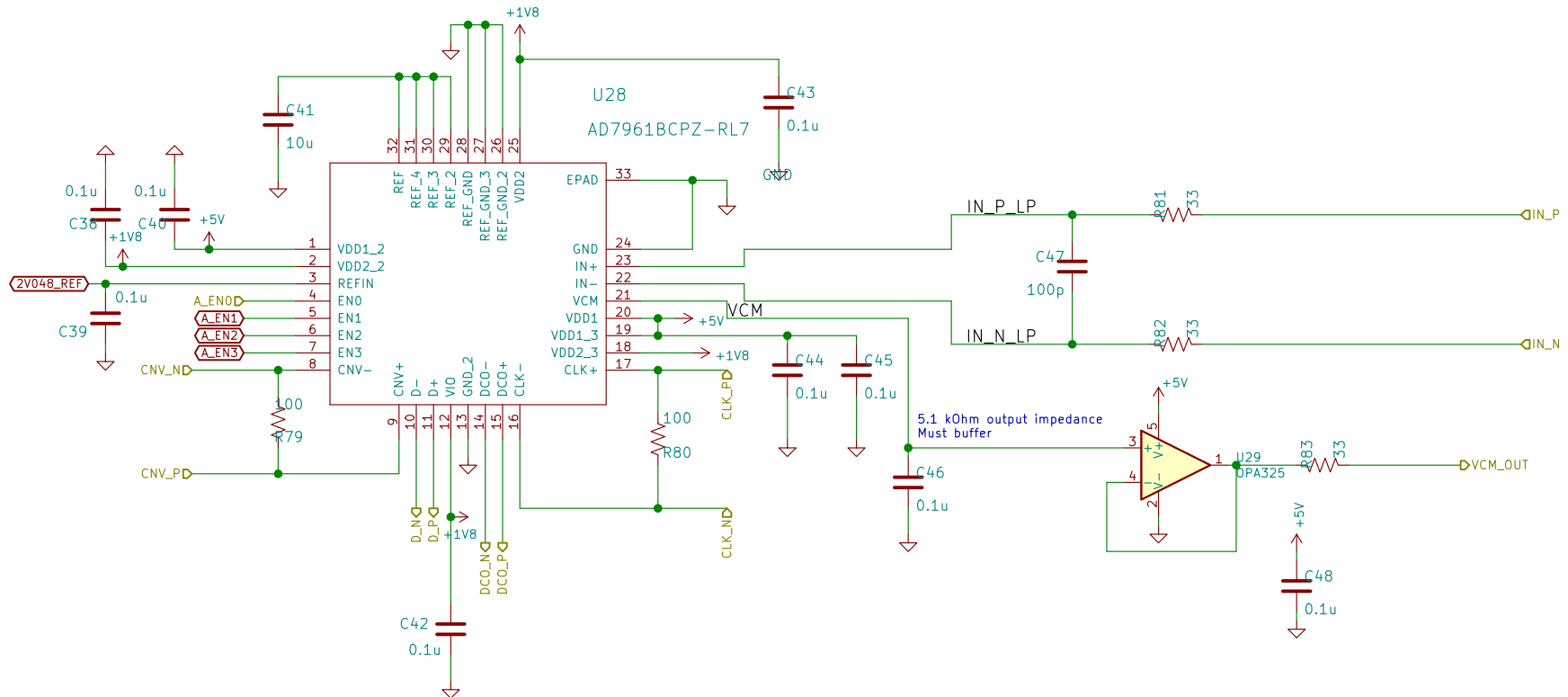




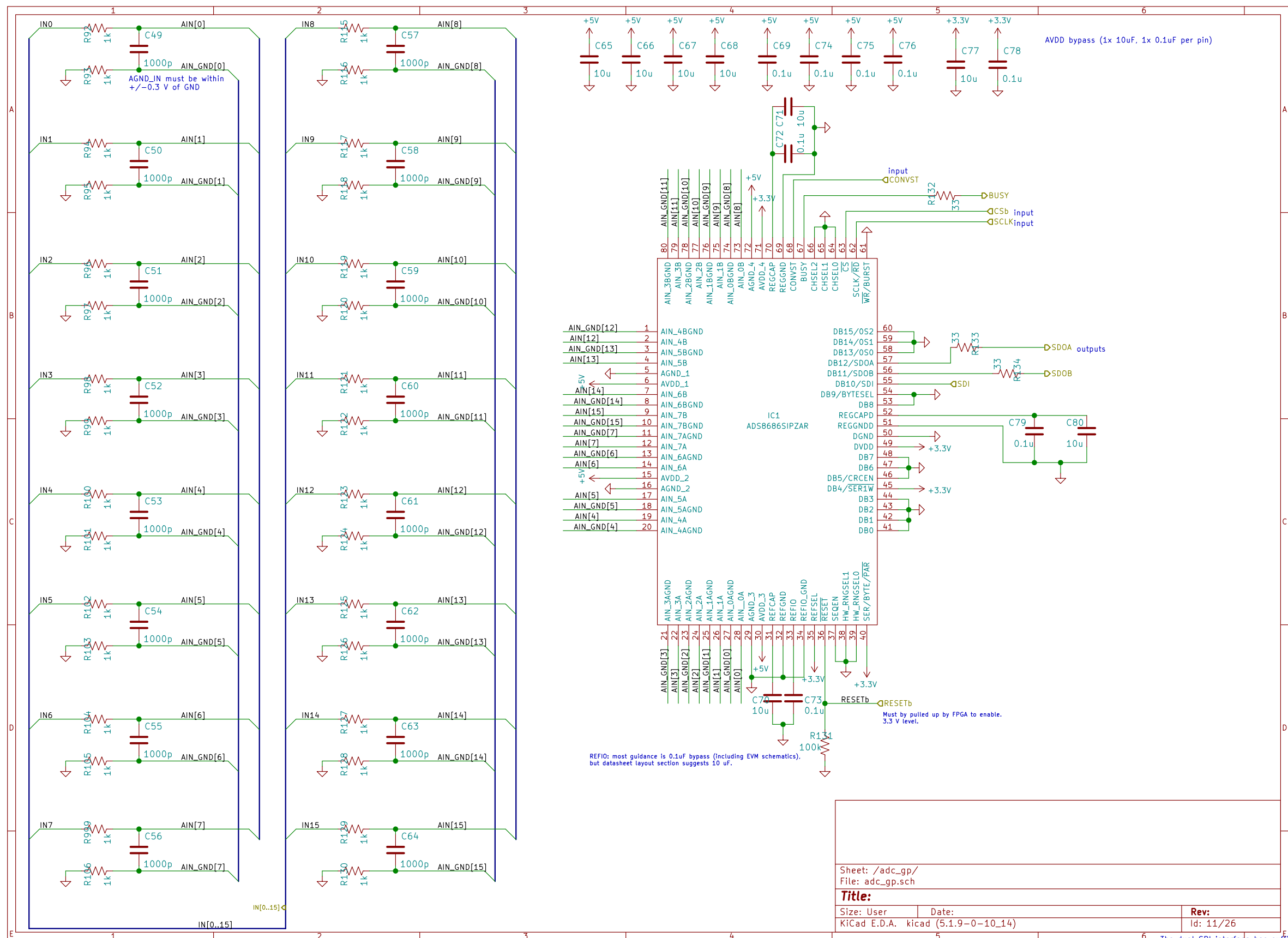
FPGA power: standard "canon-style" 2.1mm / 5.5mm jack. The outer ring is connected to DGND. The center pin is connected to +VDC.



Use internal buffer (x2) with 2.048V ref.
 "External reference of 2.048 V applied to the REFIN pin
 (high impedance input). The on-chip buffer gains this by 2
 and drives the REF pin with 4.096 V"
 EN3=X, EN2=0, EN1=0, EN0=1 (28 MHz BW)
 EN3=X, EN2=1, EN1=0, EN0=1 (9 MHz BW, use this BW only when the throughput is 2 MSPS or lower)
 VDD2 and VIO can come from the same supply.
 But route and decouple separately.

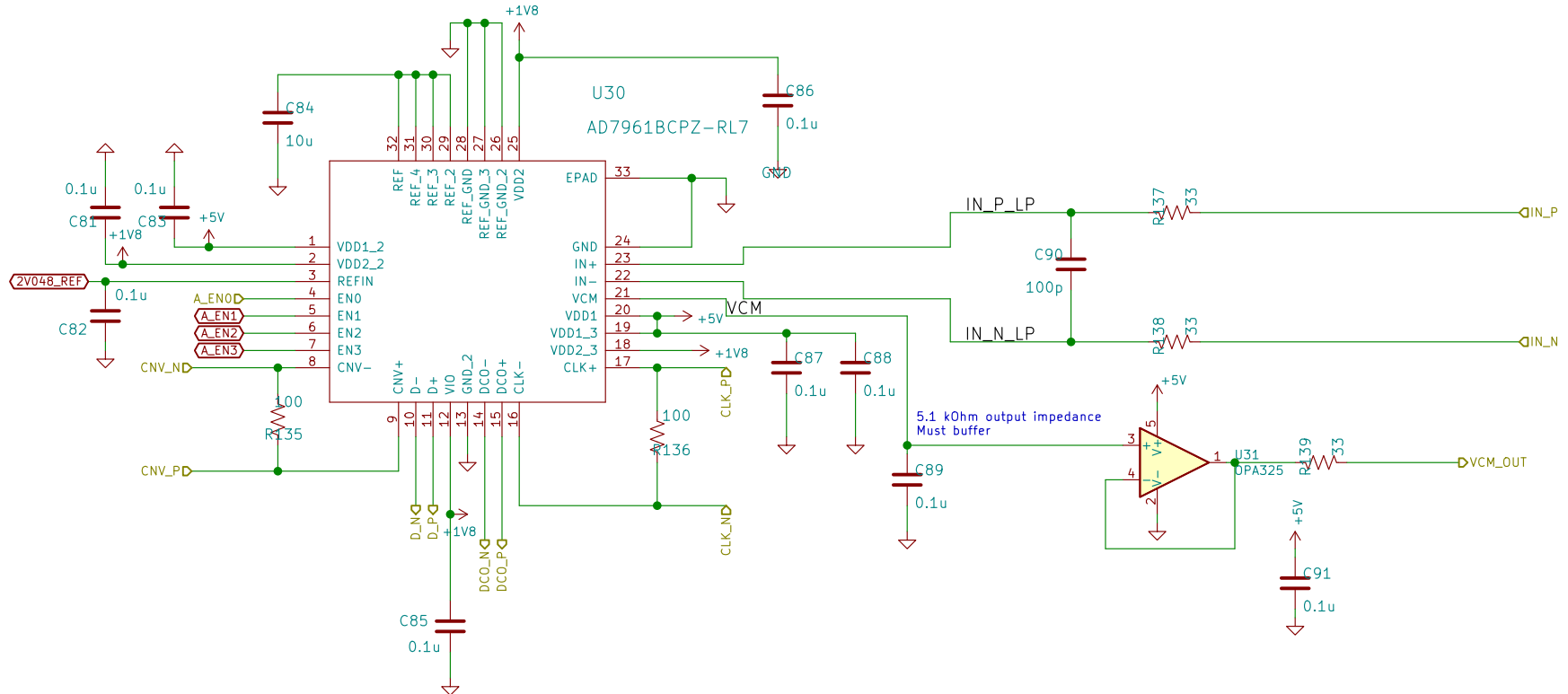


Sheet: /adc1/ File: adc.sch		
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The dual SPI interface has sufficient BW to clock the data out at the 1 MSPS (just need 16 MHz clock rate)

Use internal buffer (x2) with 2.048V ref.
 "External reference of 2.048 V applied to the REFIN pin
 (high impedance input). The on-chip buffer gains this by 2
 and drives the REF pin with 4.096 V"
 EN3=X, EN2=0, EN1=0, EN0=1 (28 MHz BW)
 EN3=X, EN2=1, EN1=0, EN0=1 (9 MHz BW, use this BW only when the throughput is 2 MSPS or lower)
 VDD2 and VIO can come from the same supply.
 But route and decouple separately.



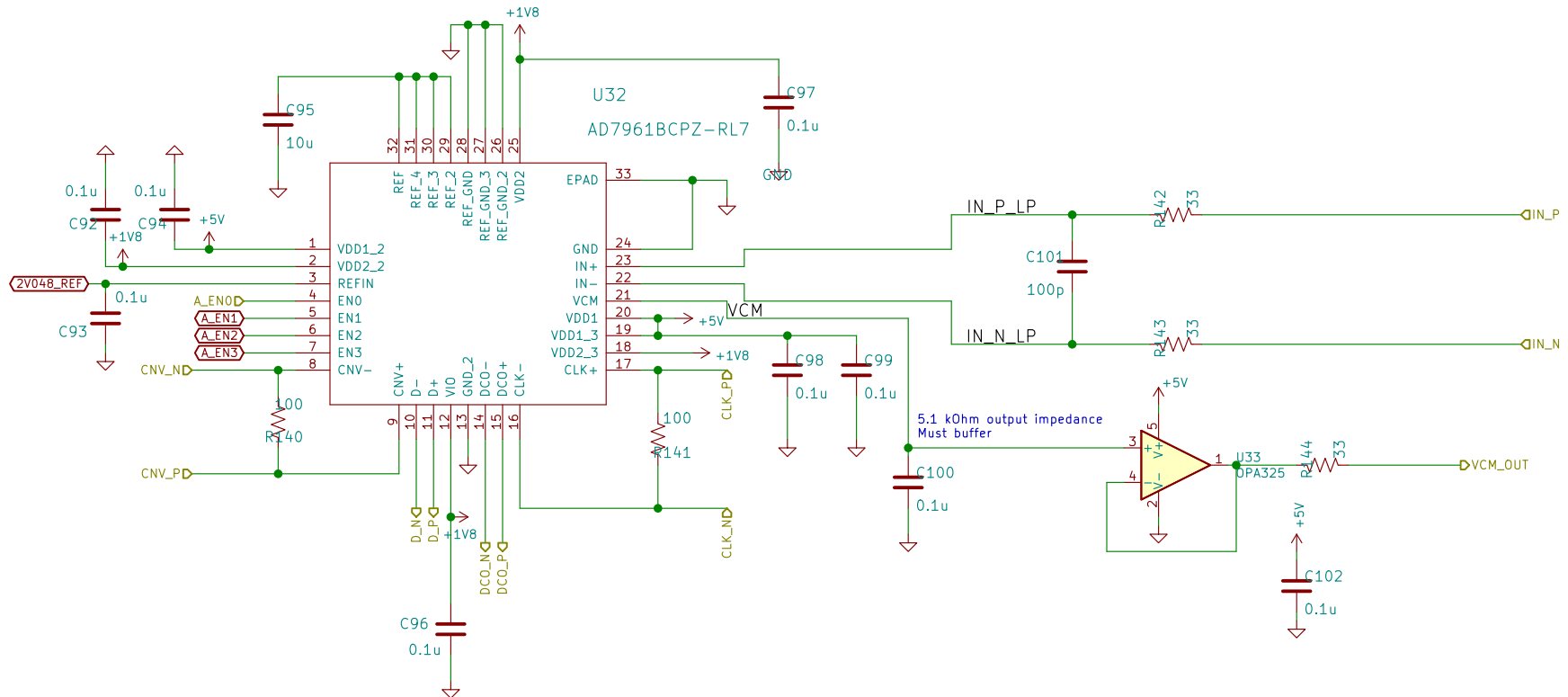
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 KiCad E.D.A. kicad (5.1.9-0-10_14)

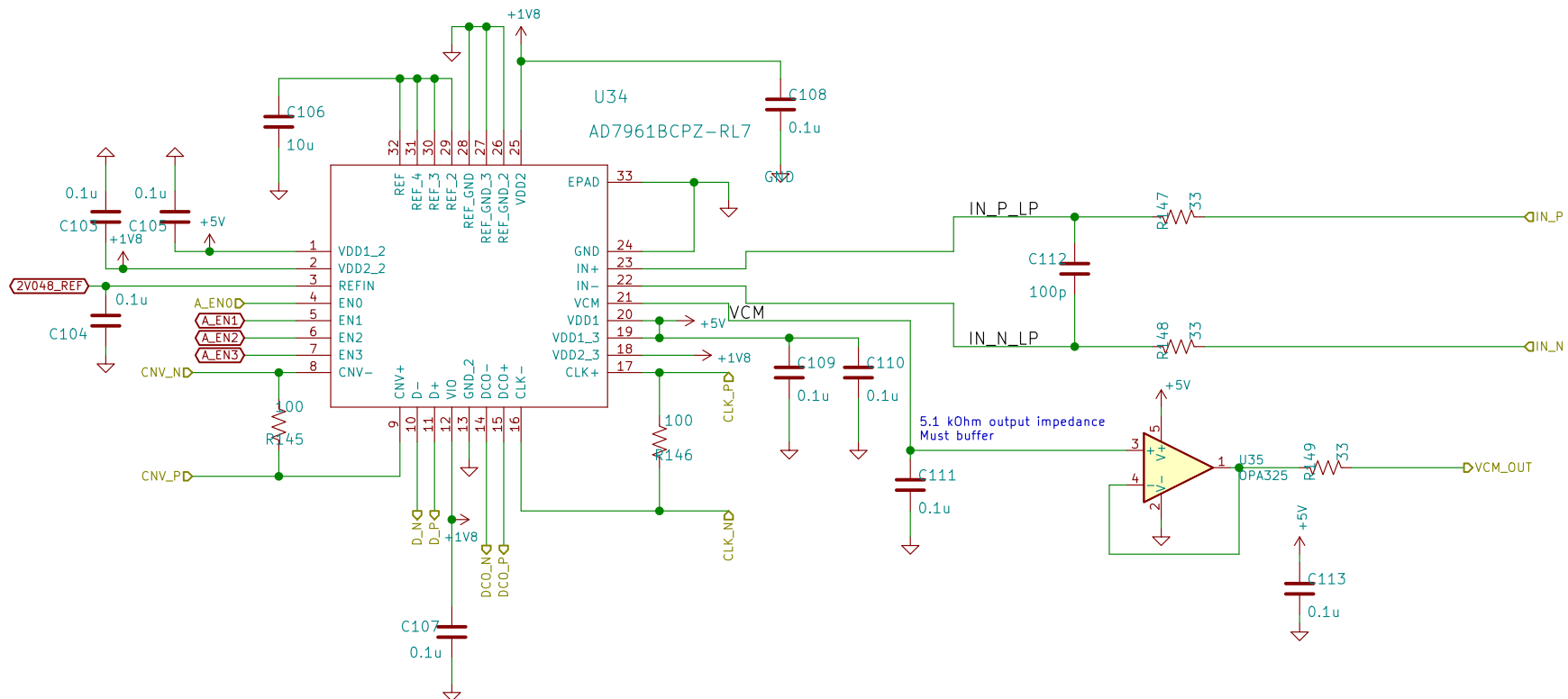
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Use internal buffer (x2) with 2.048V ref.
 "External reference of 2.048 V applied to the REFIN pin
 (high impedance input). The on-chip buffer gains this by 2
 and drives the REF pin with 4.096 V"
 EN3=X, EN2=0, EN1=0, EN0=1 (28 MHz BW)
 EN3=X, EN2=1, EN1=0, EN0=1 (9 MHz BW, use this BW only when the throughput is 2 MSPS or lower)
 VDD2 and VIO can come from the same supply.
 But route and decouple separately.



Sheet: /adc2/ File: adc.sch		
Title:		
Size: A	Date:	Rev:
KiCad E.D.A. kicad (5.1.9-0-10_14)		Id: 13/26

Use internal buffer (x2) with 2.048V ref.
 "External reference of 2.048 V applied to the REFIN pin
 (high impedance input). The on-chip buffer gains this by 2
 and drives the REF pin with 4.096 V"
 EN3=X, EN2=0, EN1=0, EN0=1 (28 MHz BW)
 EN3=X, EN2=1, EN1=0, EN0=1 (9 MHz BW, use this BW only when the throughput is 2 MSPS or lower)
 VDD2 and VIO can come from the same supply.
 But route and decouple separately.

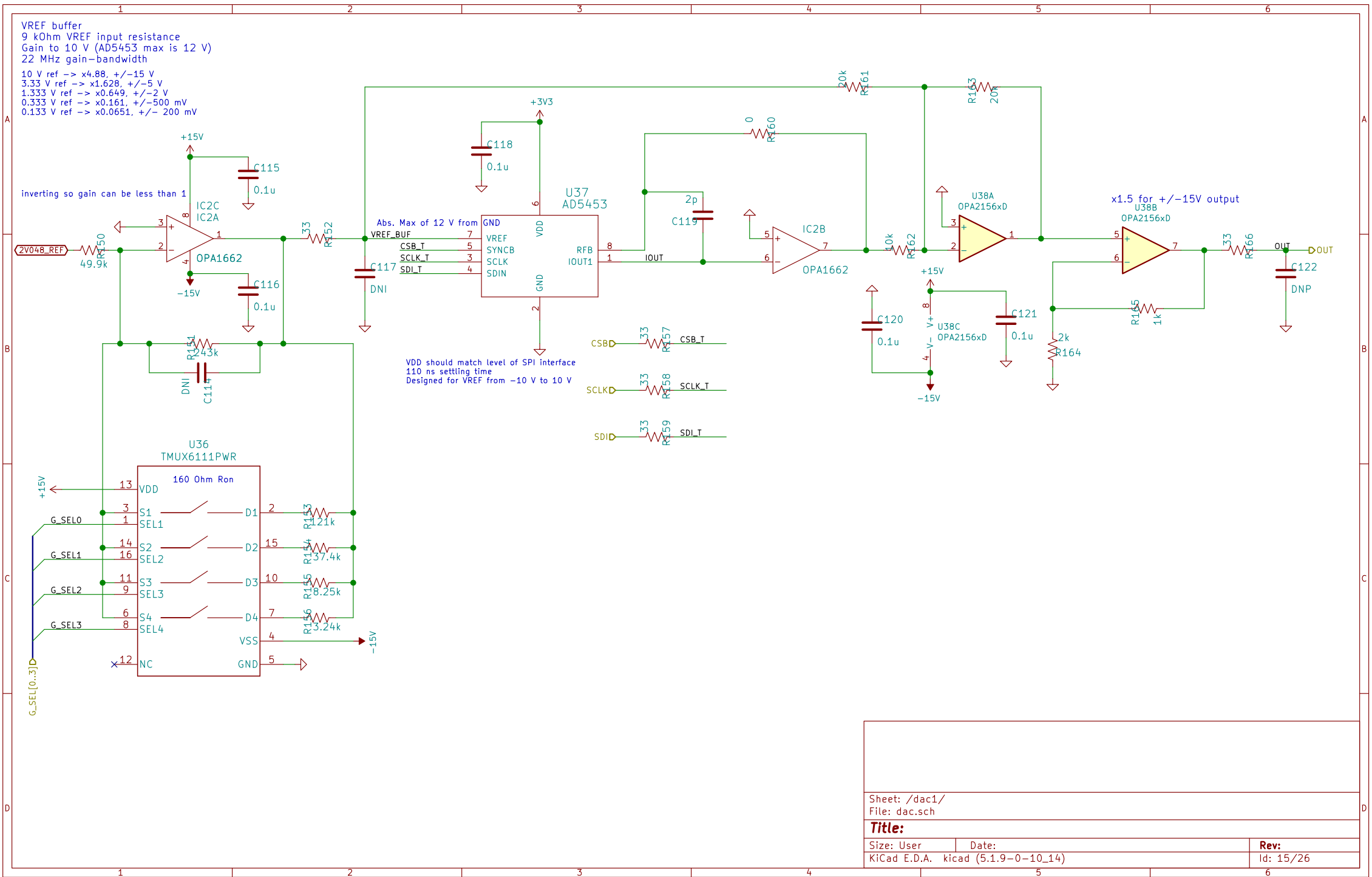


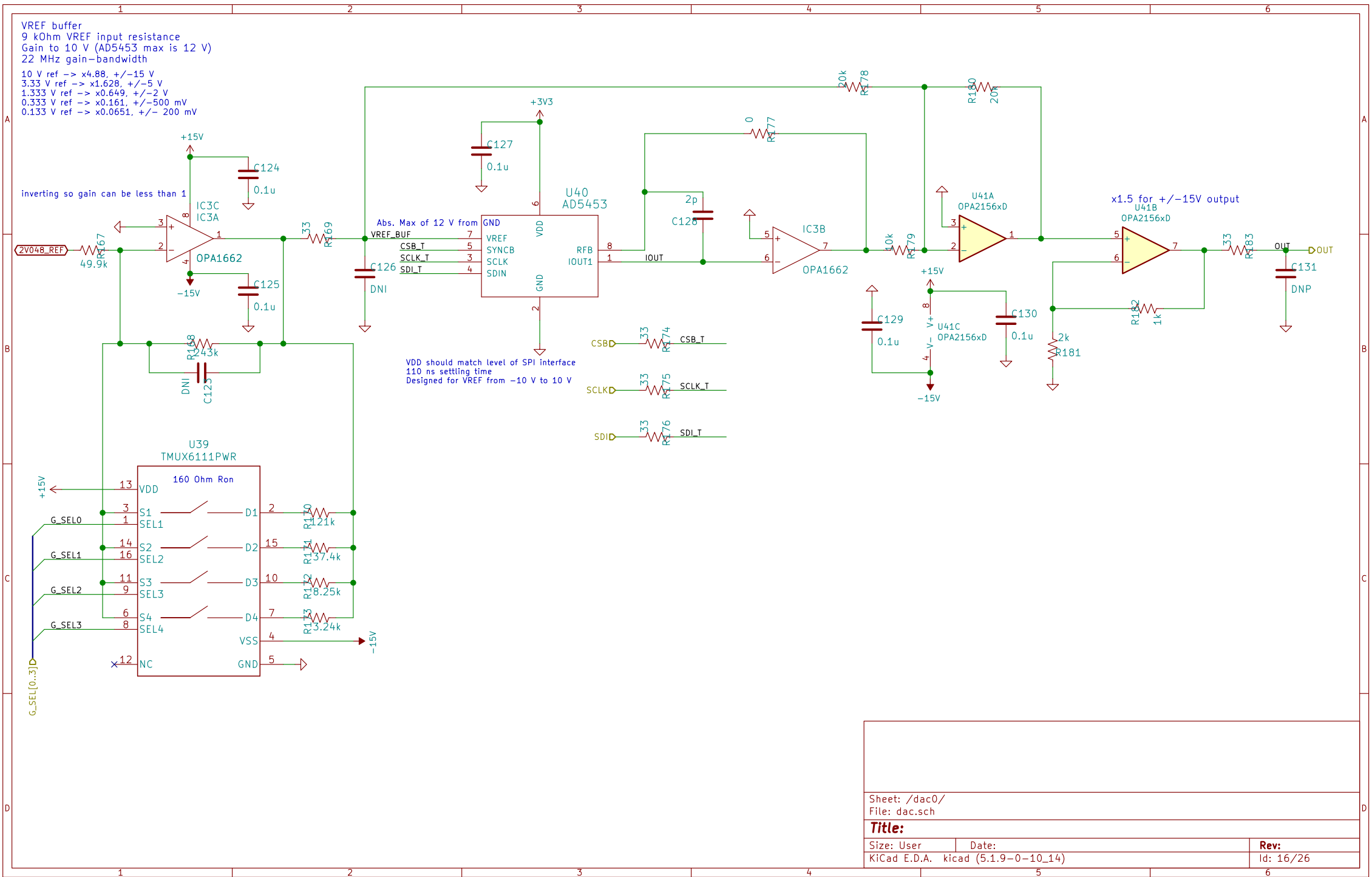
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 File: adc.sch

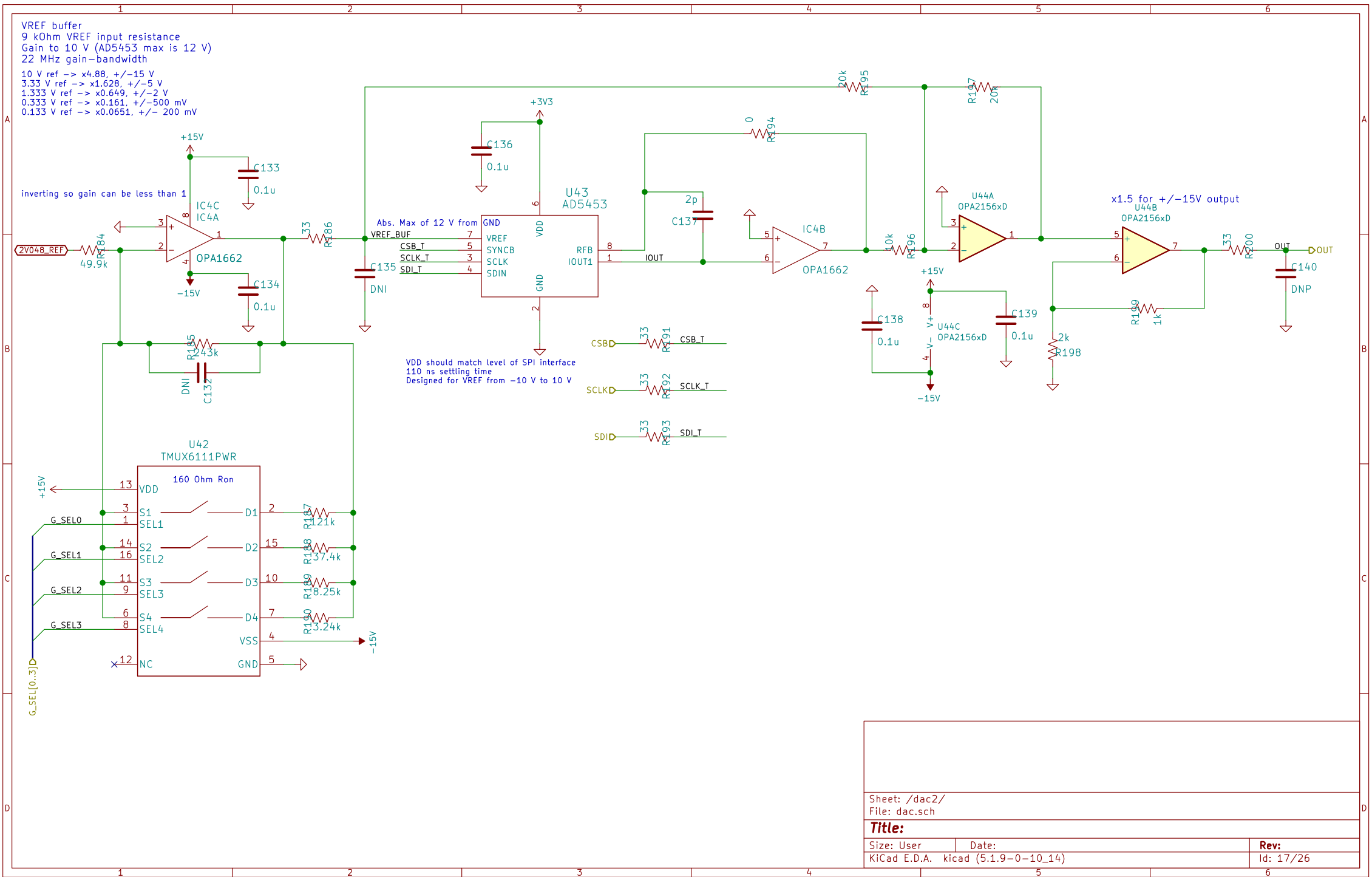
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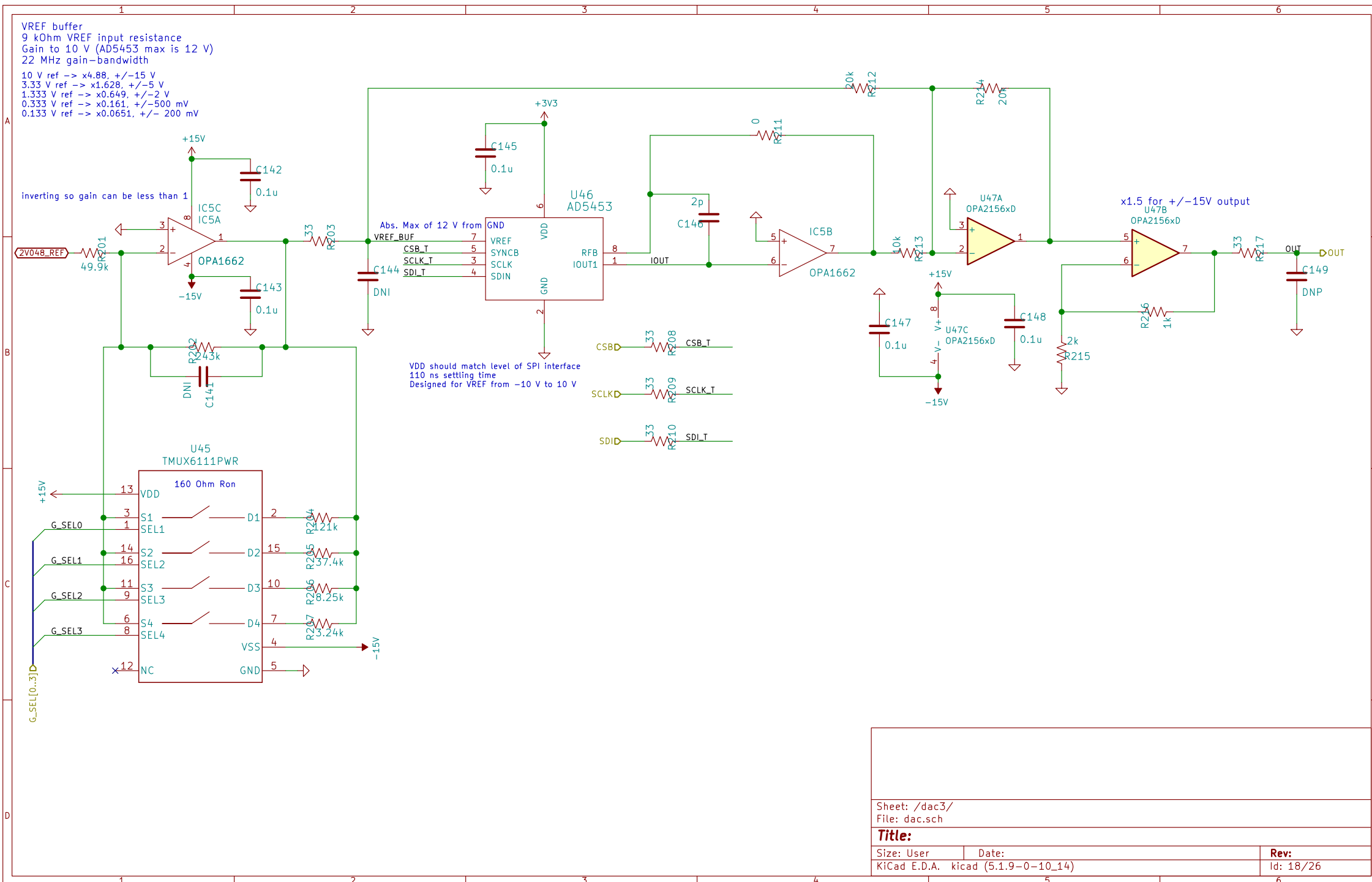
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 KiCad E.D.A. kicad (5.1.9-0-10_14)

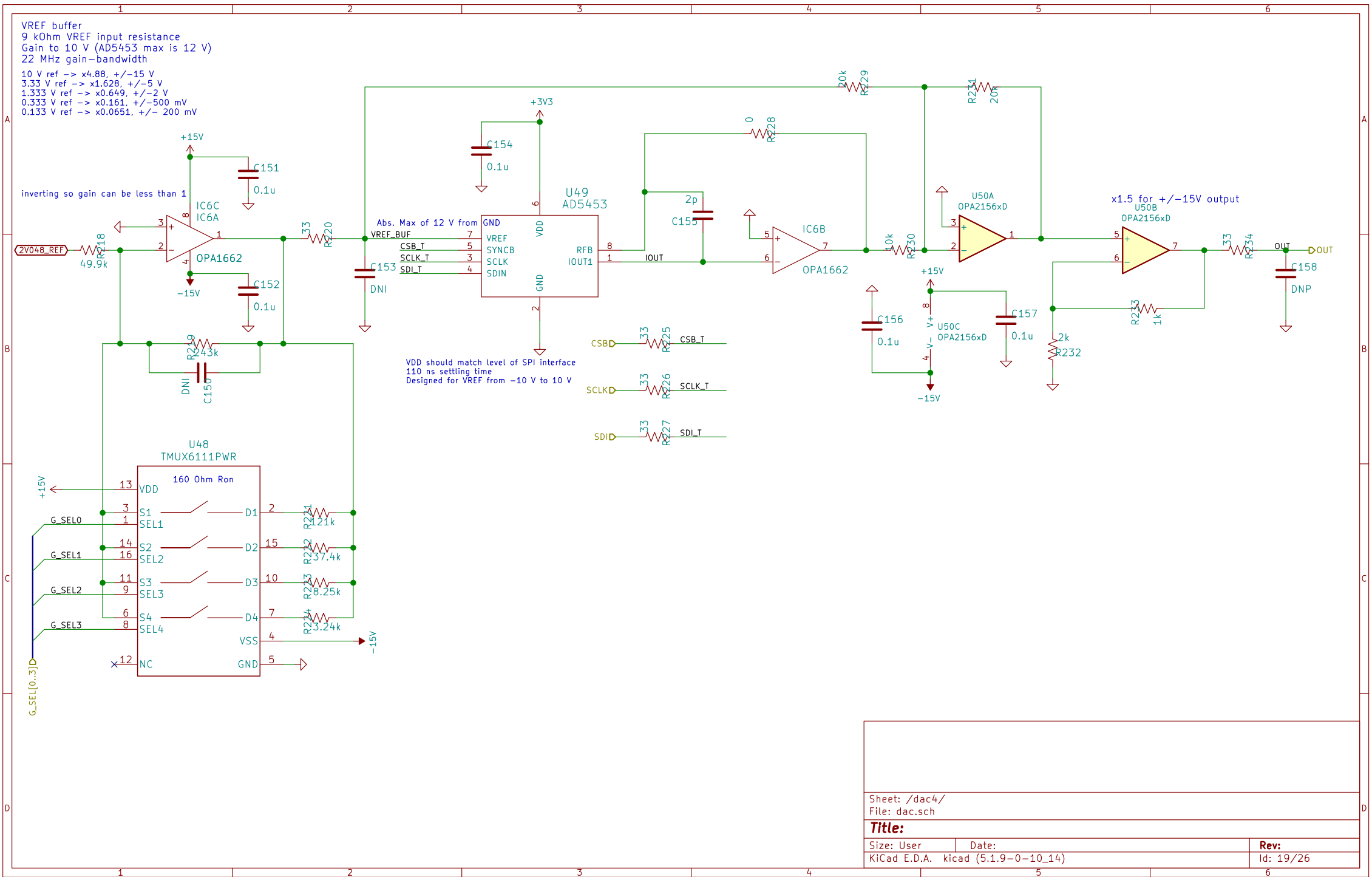
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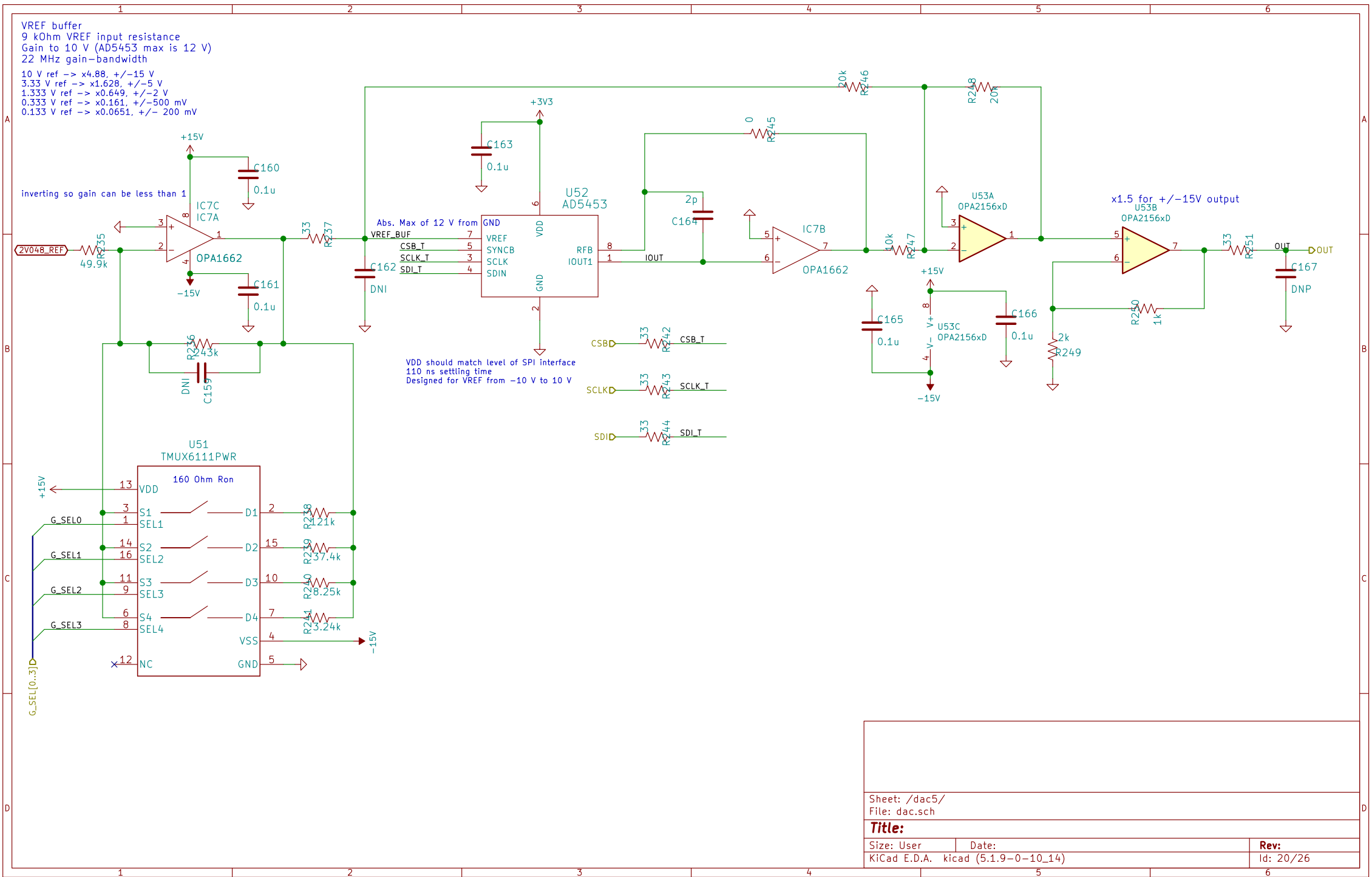


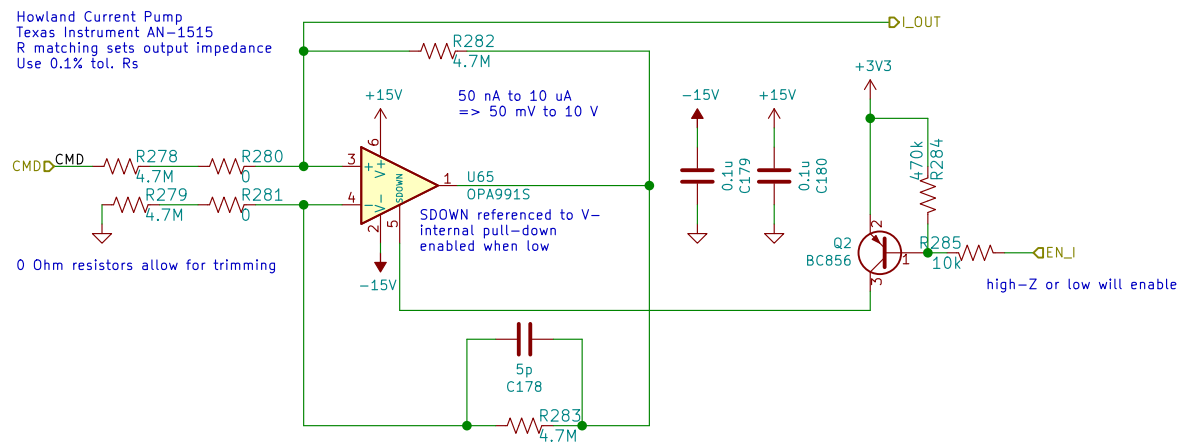












Sheet: /dac_gp2/howland_ipump/
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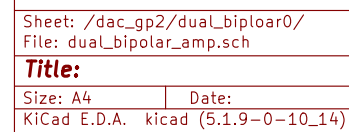
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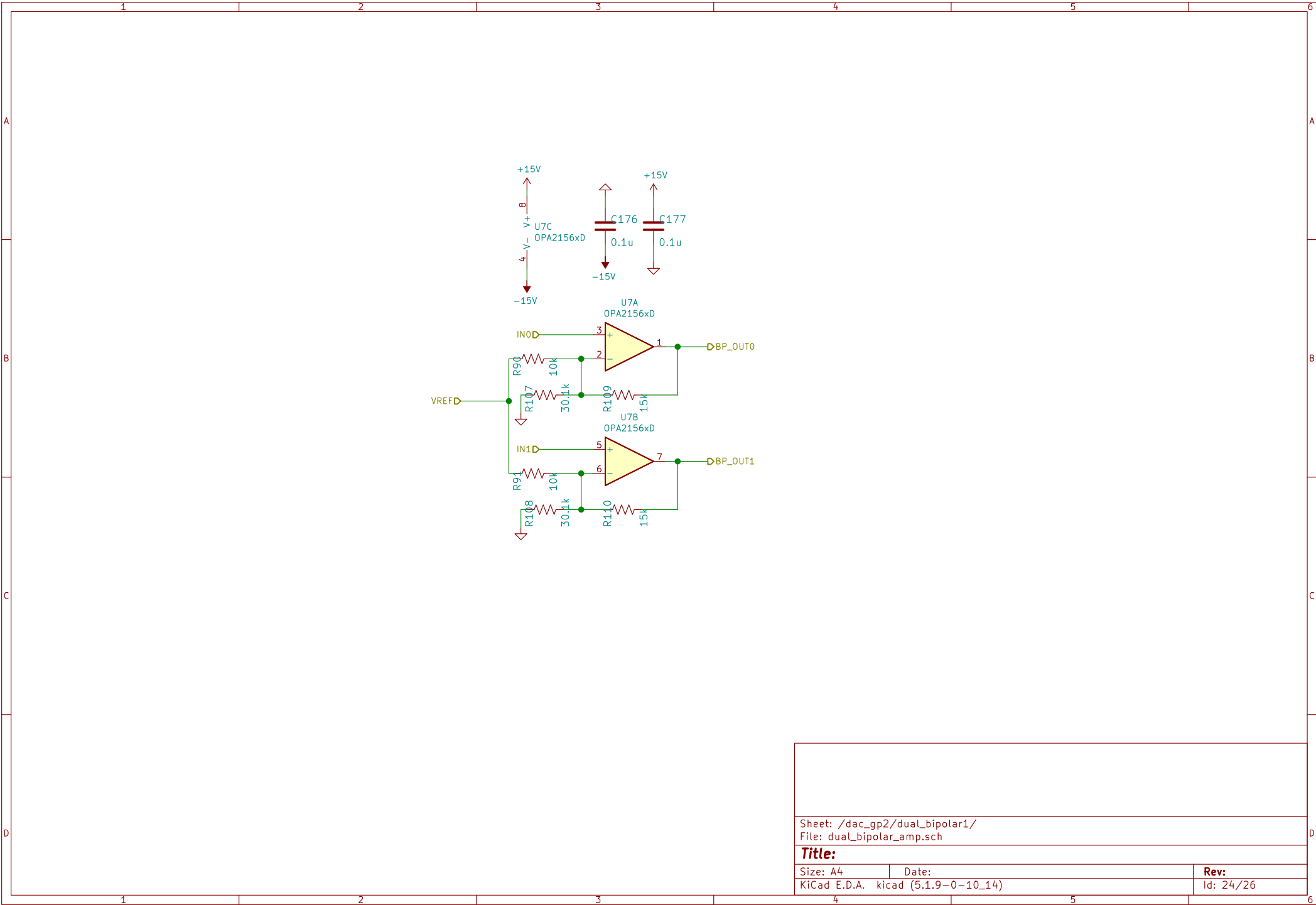
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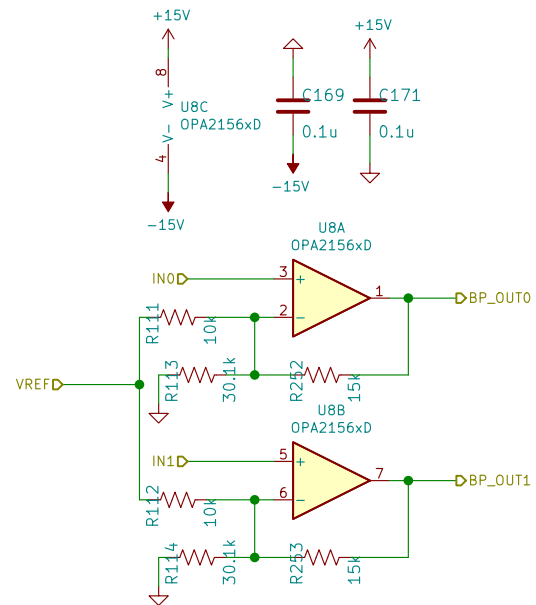
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Sheet: /dac_gp2/dual_biploar2/
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Title:

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