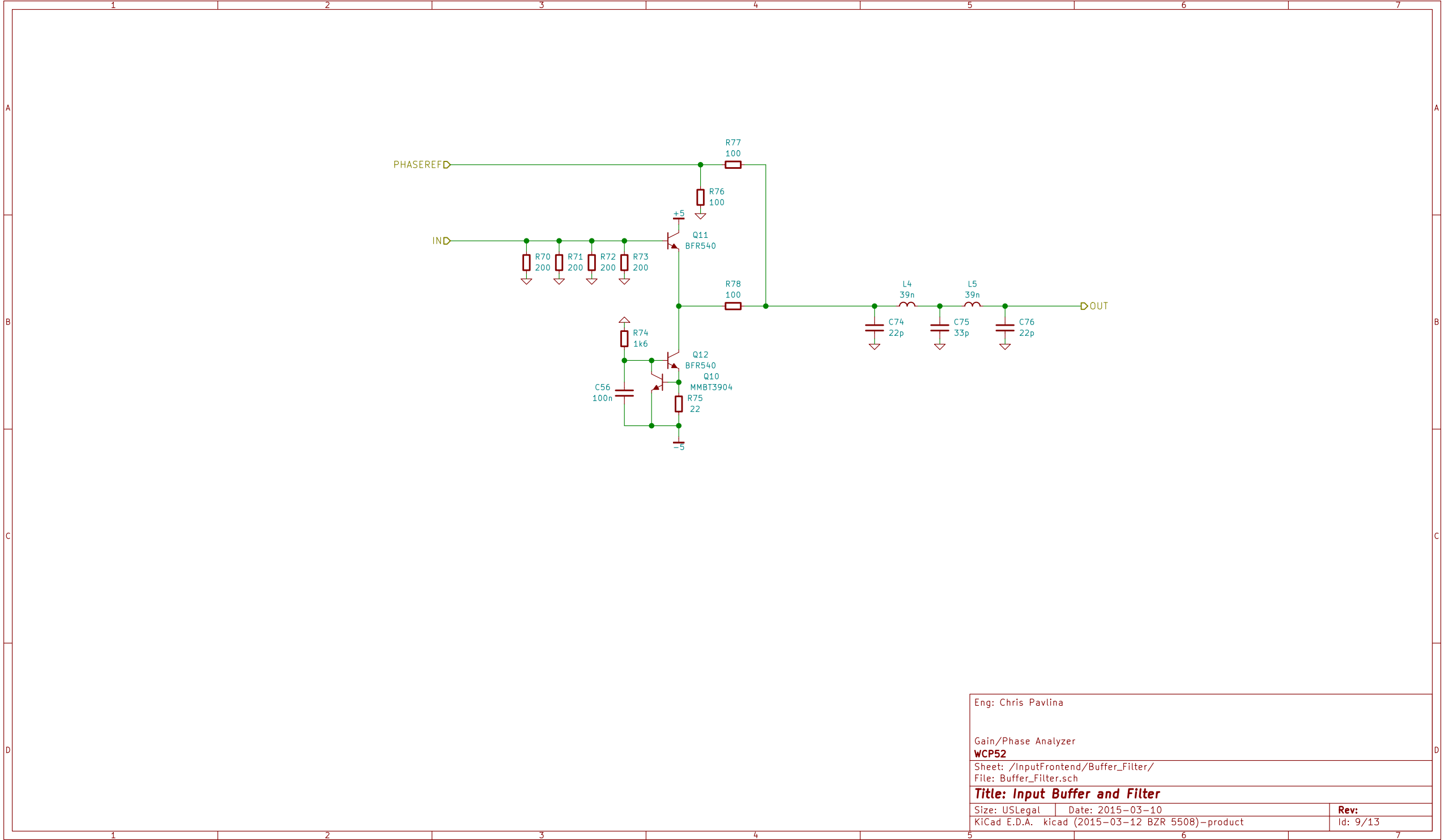


Eng: Chris Pavlina		
Gain/Phase Analyzer		
WCP52		
Sheet: /		
File: wcp52.sch		
Title: Block Diagram		
Size: USLegal	Date: 2015-03-10	Rev:
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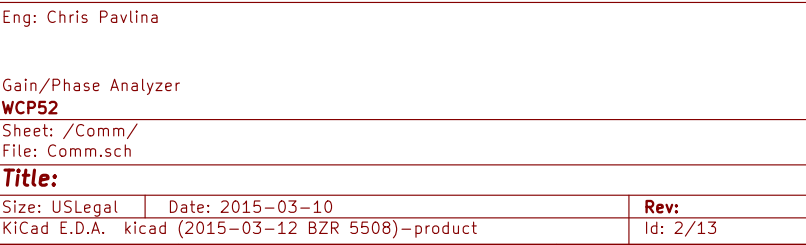
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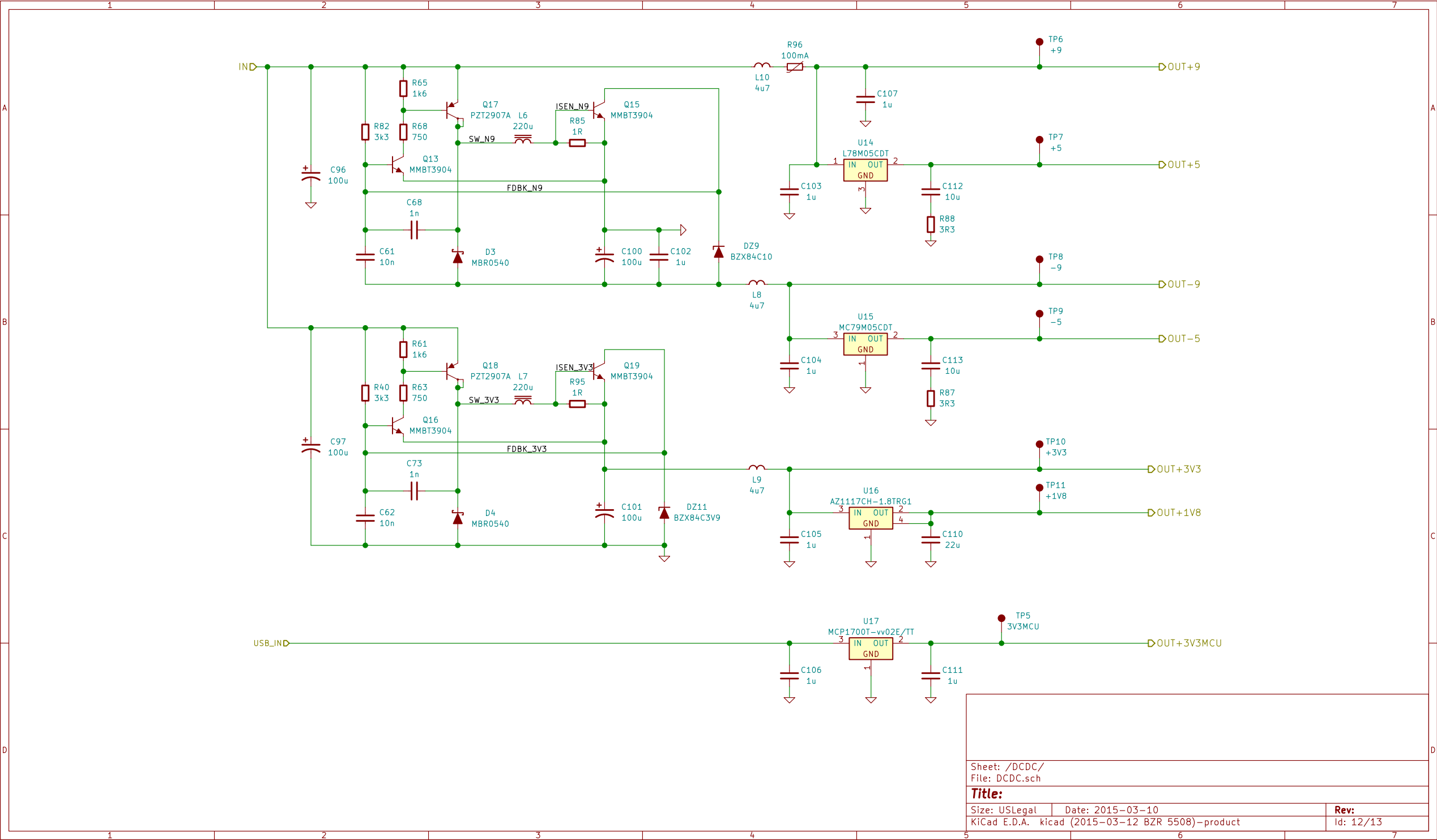
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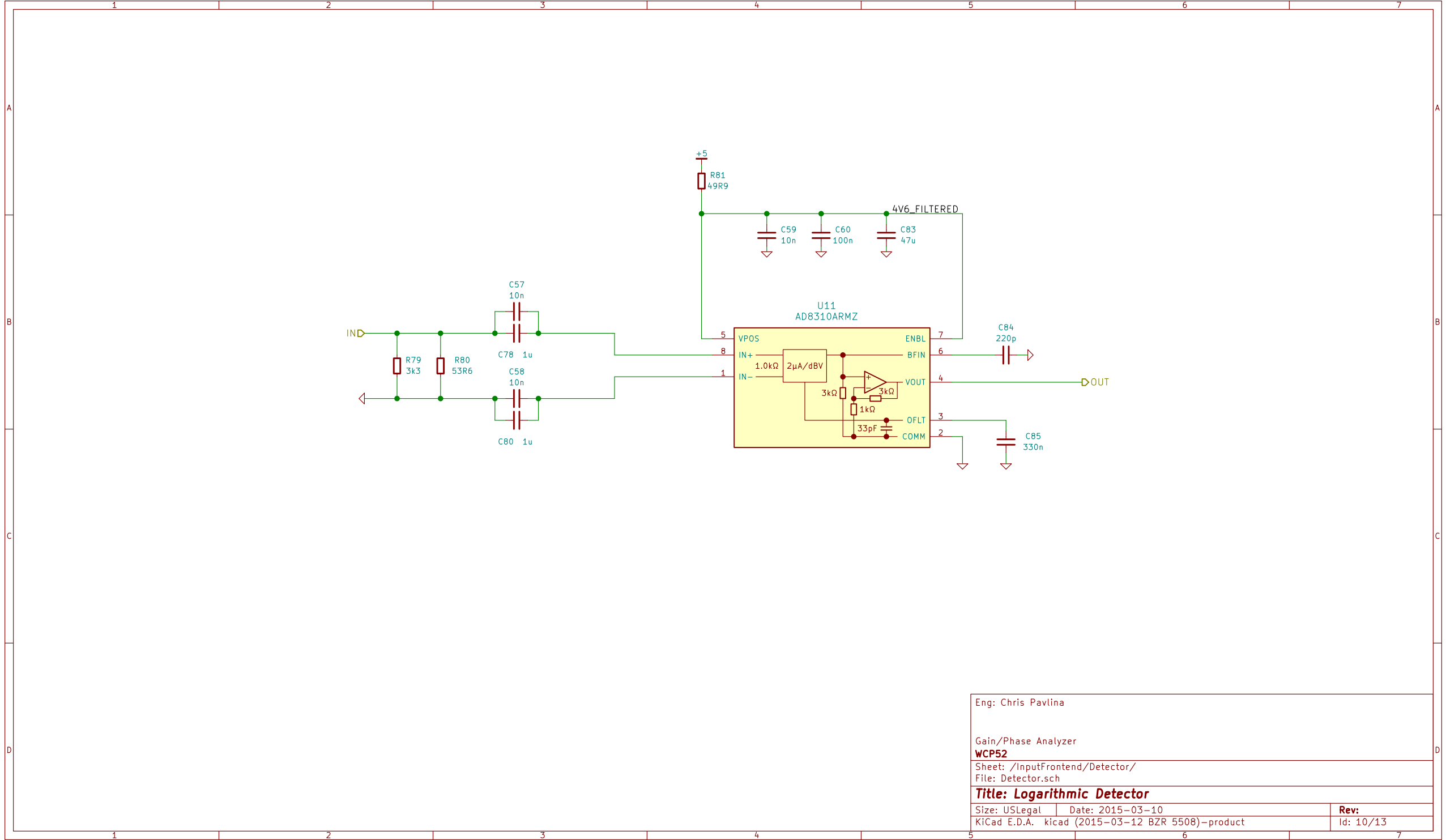
Sheet: /InputFrontend/Buffer\_Filter/  
File: Buffer\_Filter.sch

**Title: Input Buffer and Filter**

Size: USLegal	Date: 2015-03-10	Rev:
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**WCP52**

Sheet: /InputFrontend/Detector/

File: Detector.sch

**Title: Logarithmic Detector**

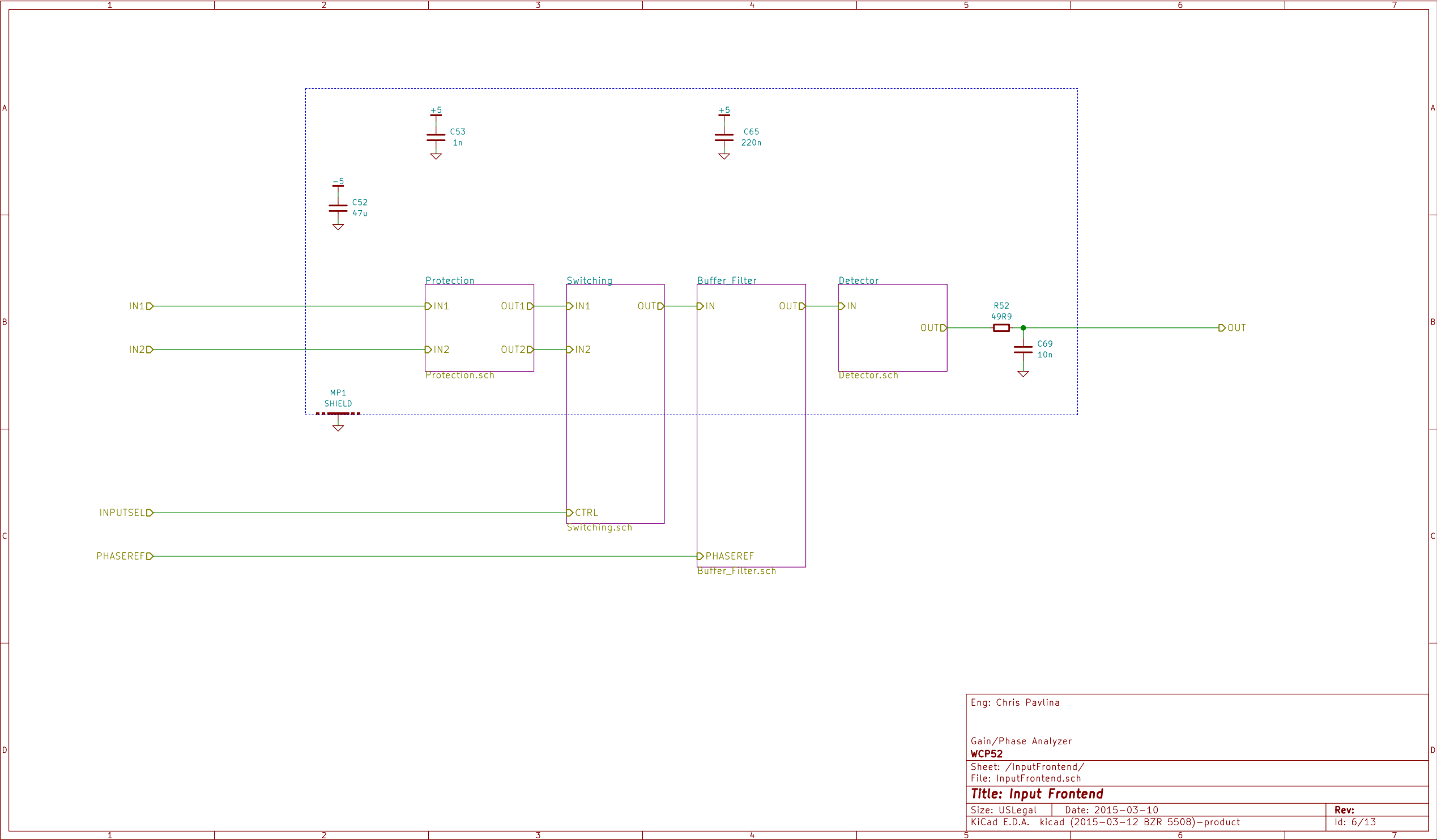
Size: USLegal

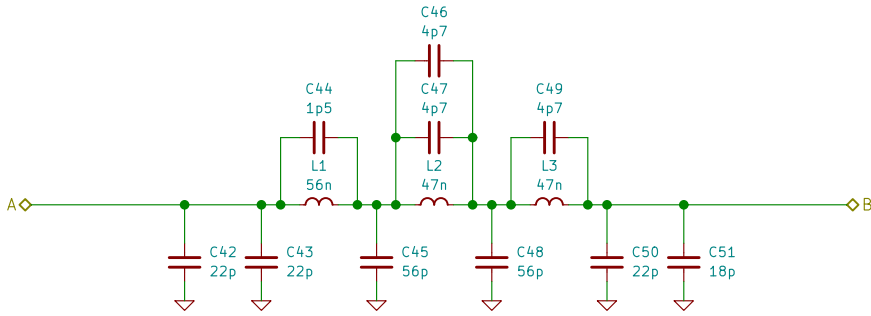
Date: 2015-03-10

**Rev:**

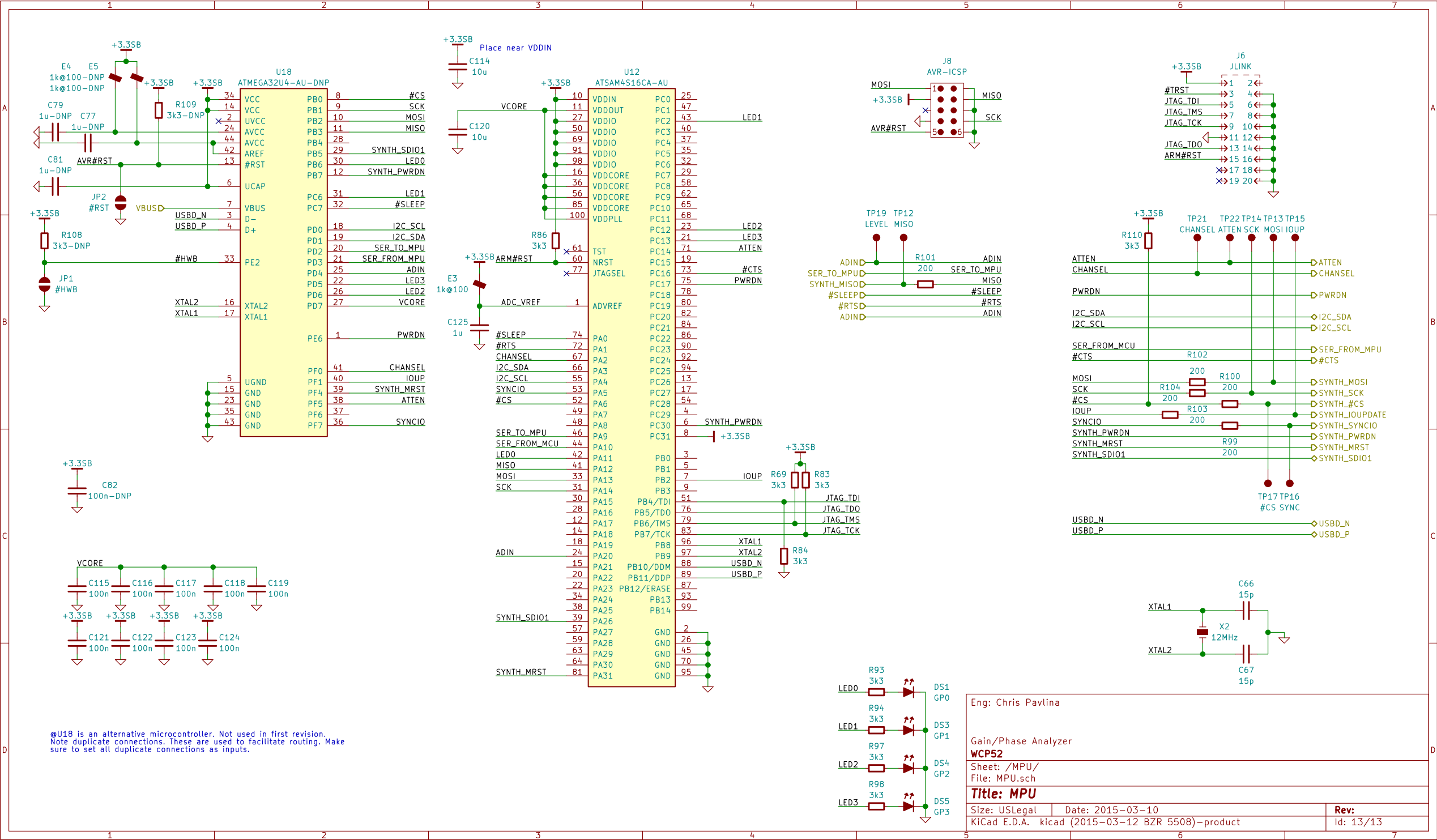
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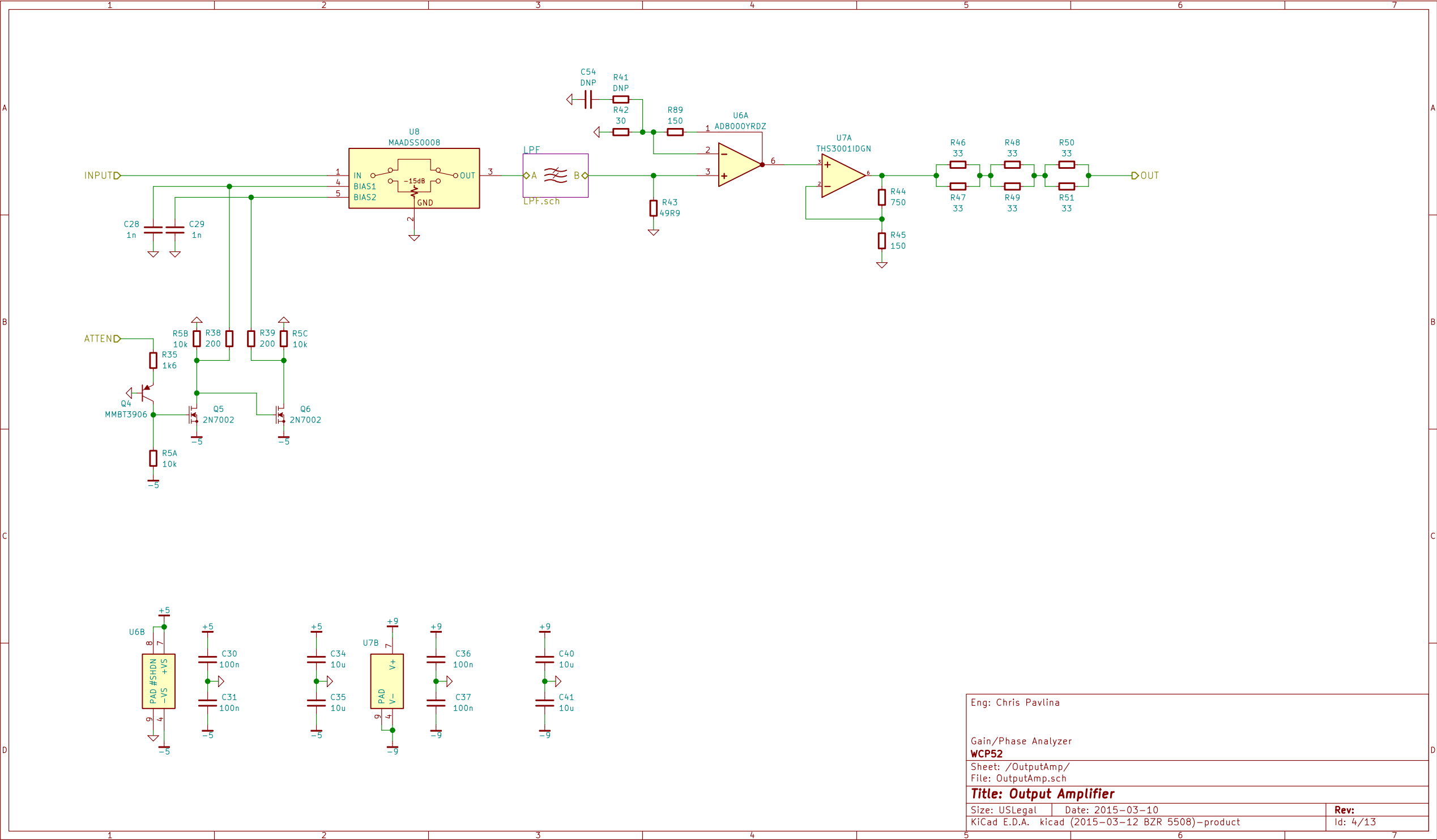


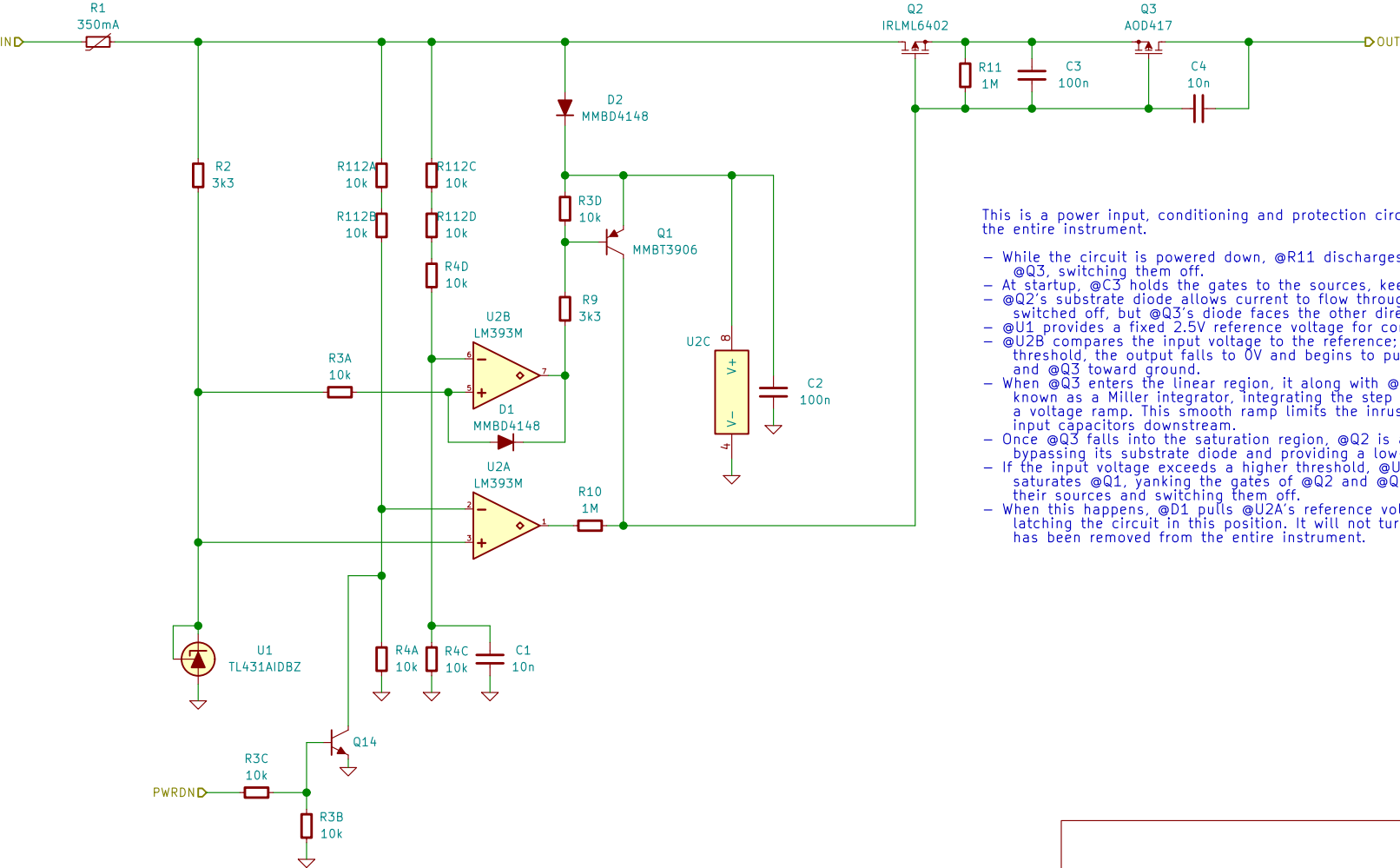


Eng: Chris Pavlina		
Gain/Phase Analyzer		
WCP52		
Sheet: /OutputAmp/LPF/		
File: LPF.sch		
Title: LPF for Output Amplifier		
Size: USLegal	Date: 2015-03-10	Rev:
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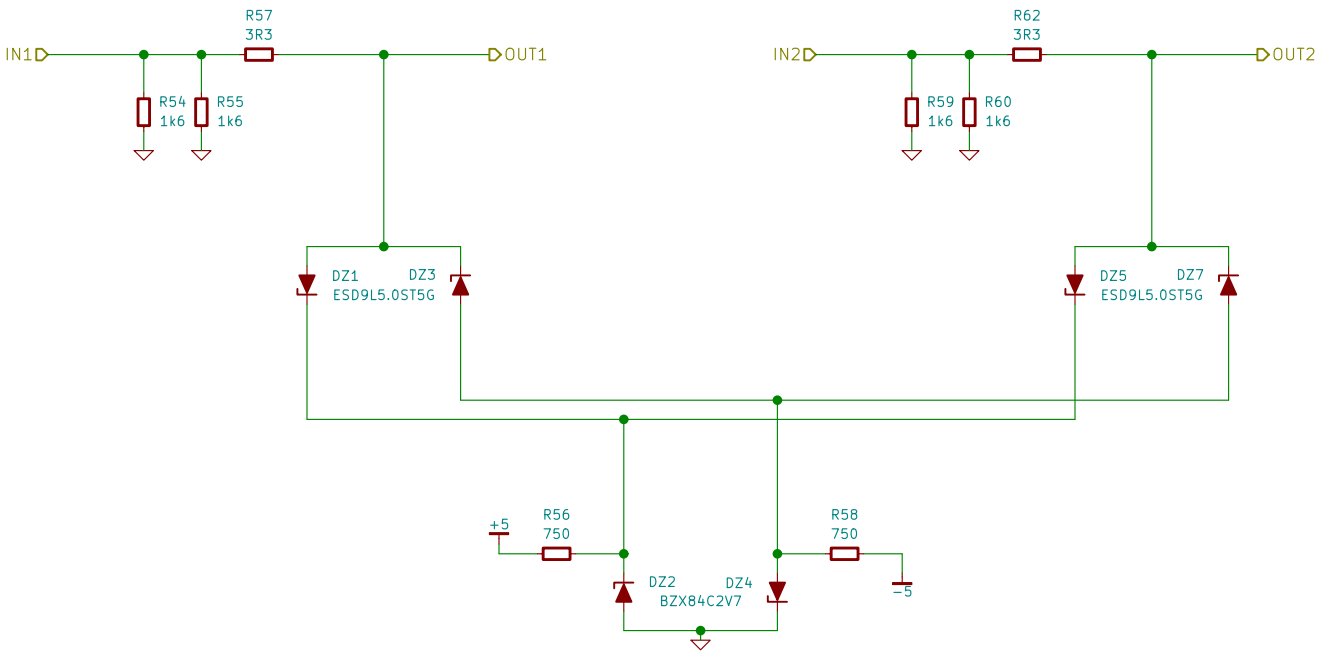






This is a power input, conditioning and protection circuit for the entire instrument.

- While the circuit is powered down, @R11 discharges the gates of @Q2 and @Q3, switching them off.
- At startup, @C3 holds the gates to the sources, keeping them switched off.
- @Q2's substrate diode allows current to flow through despite the FET being switched off, but @Q3's diode faces the other direction and does not.
- @U1 provides a fixed 2.5V reference voltage for comparison.
- @U2B compares the input voltage to the reference; when it exceeds a threshold, the output falls to 0V and begins to pull the gates of @Q2 and @Q3 toward ground.
- When @Q3 enters the linear region, it along with @C4 forms a circuit known as a Miller integrator, integrating the step from @U2B to produce a voltage ramp. This smooth ramp limits the inrush current charging any input capacitors downstream.
- Once @Q3 falls into the saturation region, @Q2 is also in this region, bypassing its substrate diode and providing a low-impedance path for current.
- If the input voltage exceeds a higher threshold, @U2A switches on. This saturates @Q1, yanking the gates of @Q2 and @Q3 back up towards their sources and switching them off.
- When this happens, @D1 pulls @U2A's reference voltage down, latching the circuit in this position. It will not turn back on until power has been removed from the entire instrument.



Eng: Chris Pavlina

Gain/Phase Analyzer

**WCP52**

Sheet: /InputFrontend/Protection/

File: Protection.sch

**Title: Input Protection**

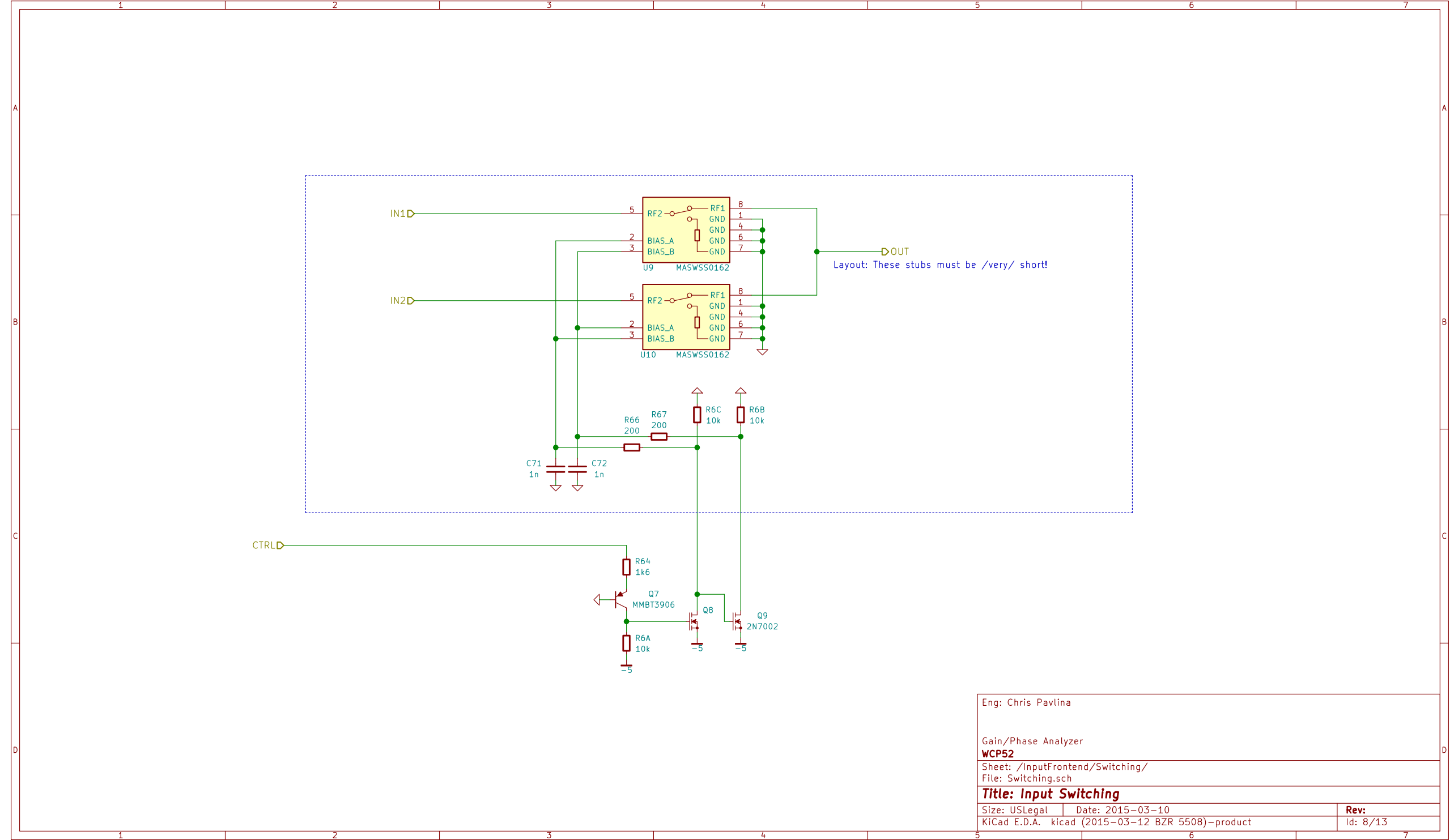
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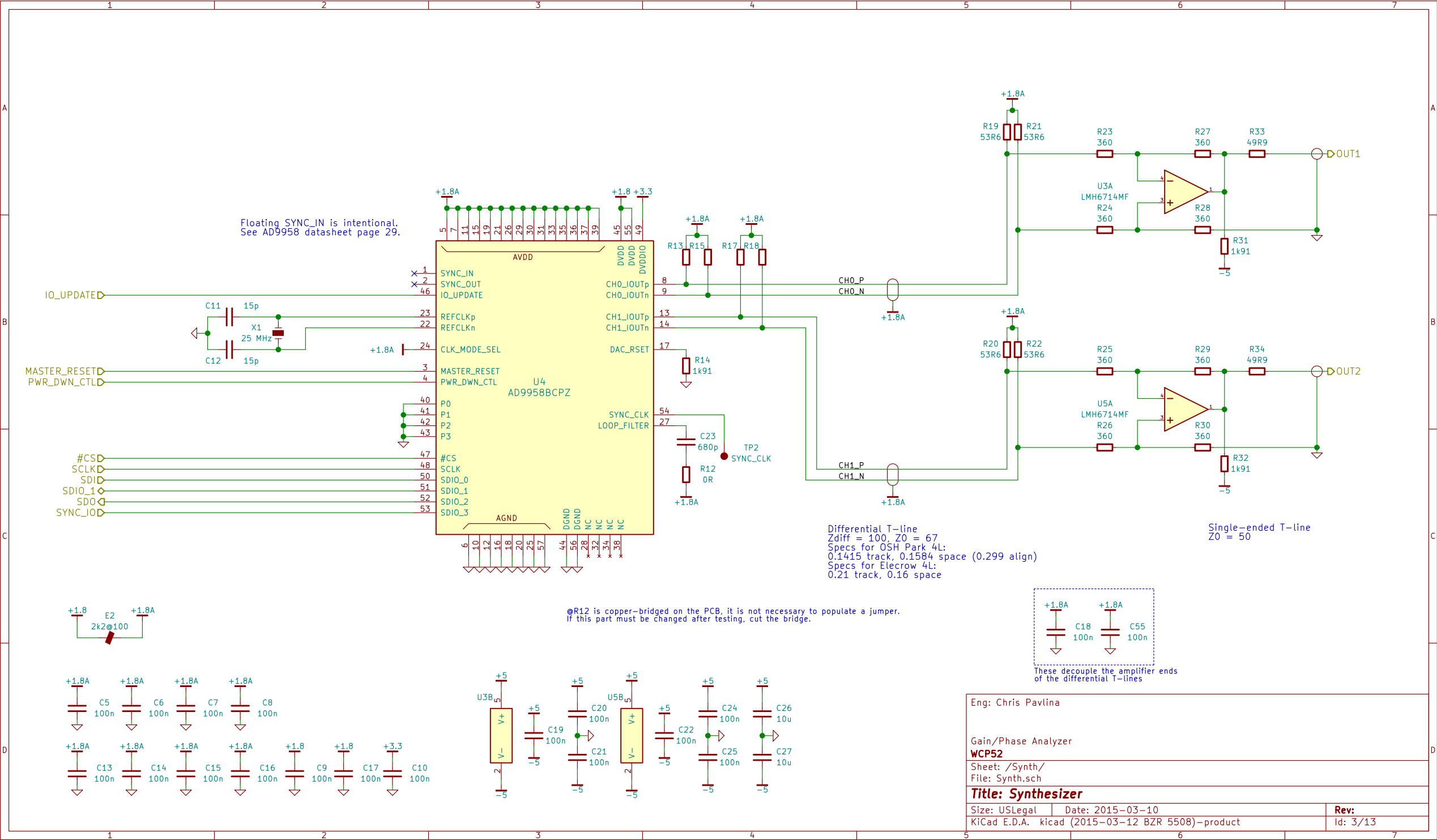
Date: 2015-03-10

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Floating SYNC\_IN is intentional.  
See AD9958 datasheet page 29.

Differential T-line  
 $Z_{diff} = 100$ ,  $Z_0 = 67$   
Specs for OSH Park 4L:  
0.1415 track, 0.1584 space (0.299 align)  
Specs for Elecrow 4L:  
0.21 track, 0.16 space

Single-ended T-line  
 $Z_0 = 50$

©R12 is copper-bridged on the PCB, it is not necessary to populate a jumper.  
If this part must be changed after testing, cut the bridge.

These decouple the amplifier ends  
of the differential T-lines

Eng: Chris Pavlina

Gain/Phase Analyzer

WCP52

Sheet: /Synth/

File: Synth.sch

Title: Synthesizer

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