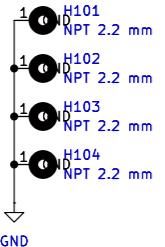
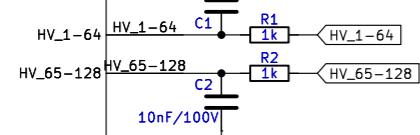
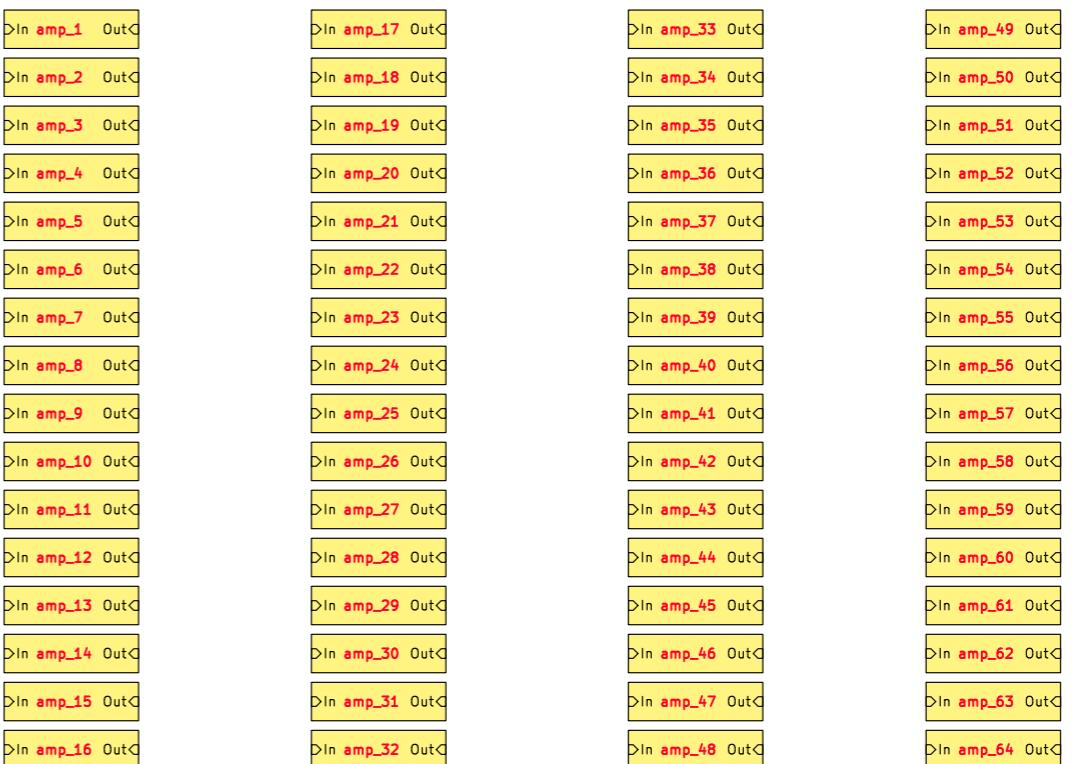
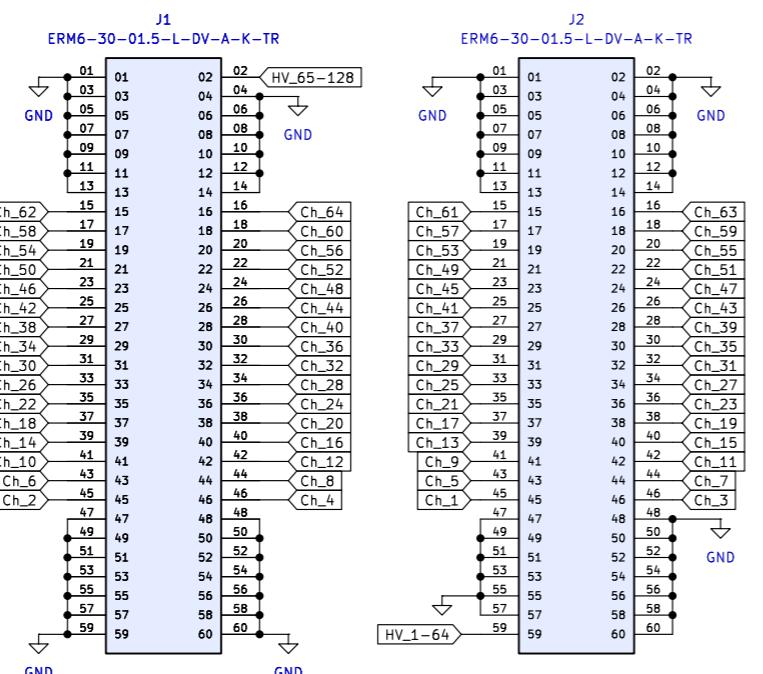
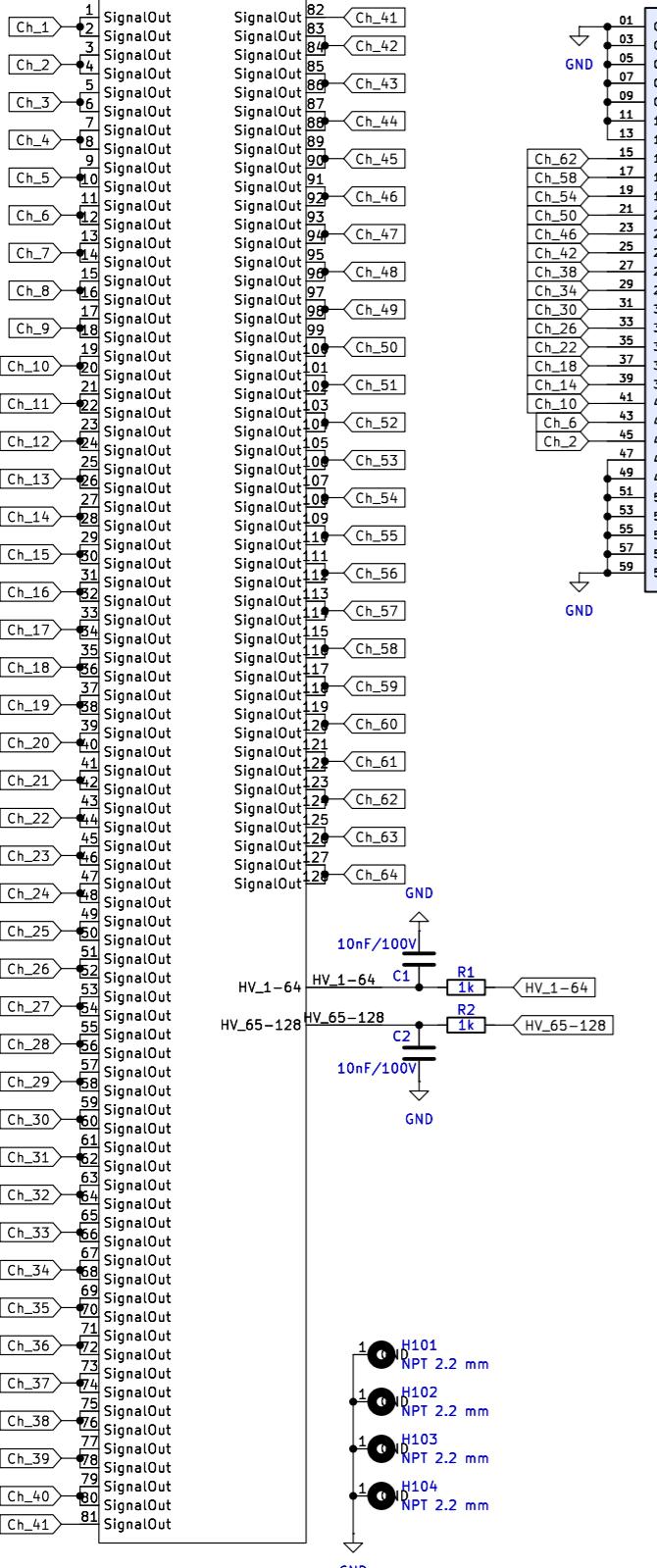


**MPPC1**

**Stackup Info**

Project: HYDRA TPC & Fiber Tracker  
 Author: Dr. Alexandru Enciu  
 Institution: Technische Universität Darmstadt



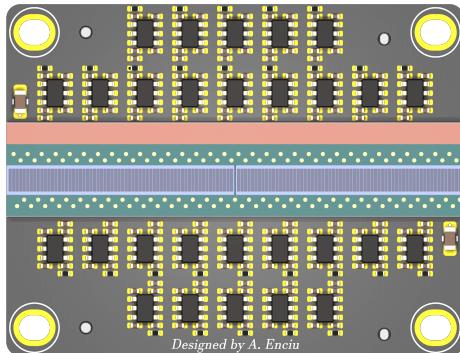
TECHNISCHE  
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DARMSTADT

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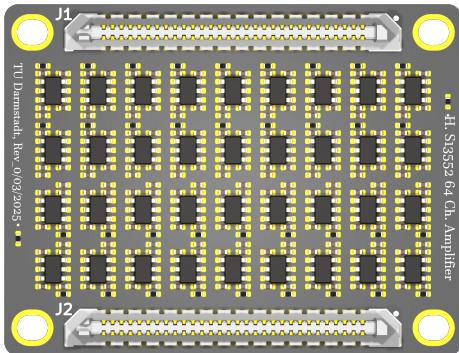
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Size: A3 Date: 2025-03-20  
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Rev: 0 Id: 1/66



TOP VIEW

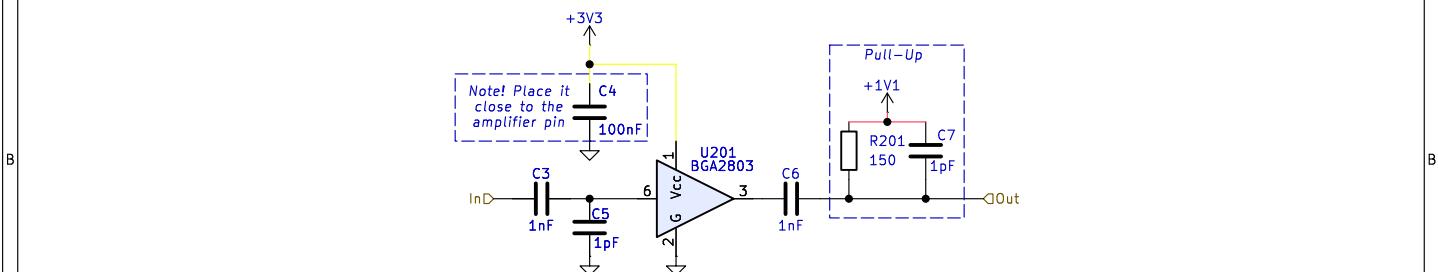
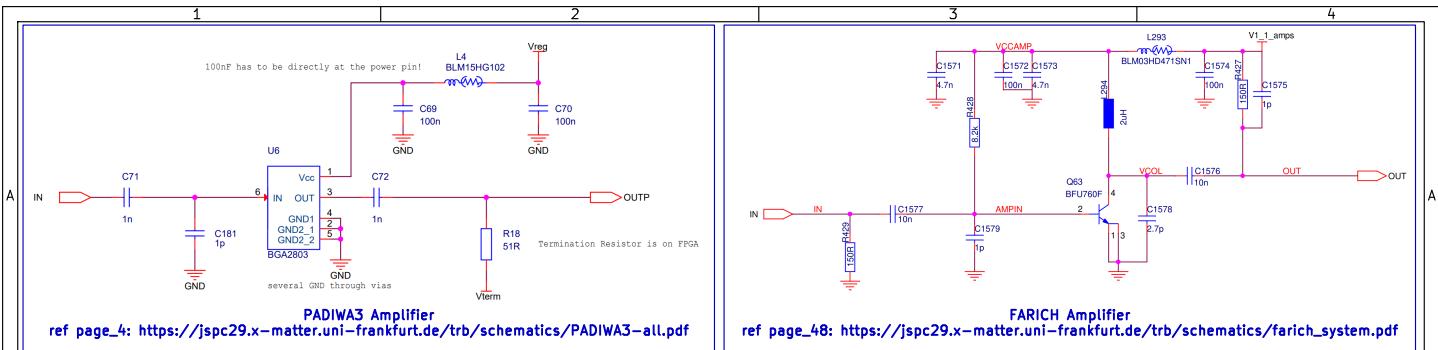


BOTTOM VIEW

Top	Signal
Inner_1	Ground
Inner_2	Signal
Inner_3	Ground
Inner_4	Power 3V3/1V1
Inner_5	Ground
Inner_6	Ground
Bottom	Signal

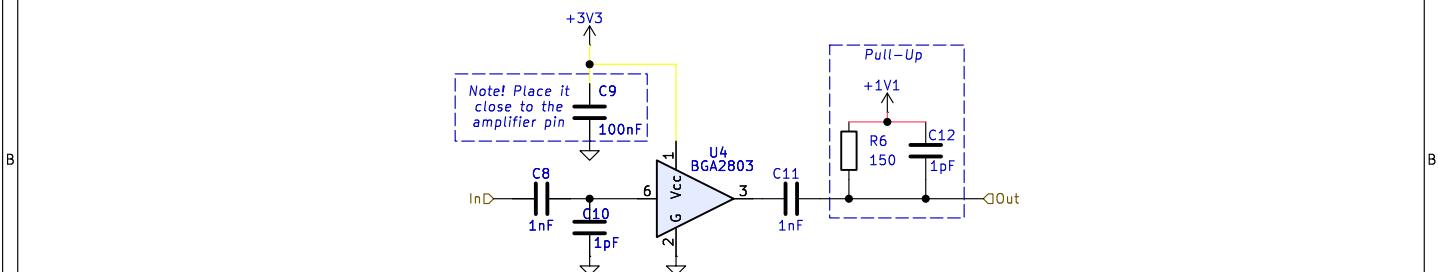
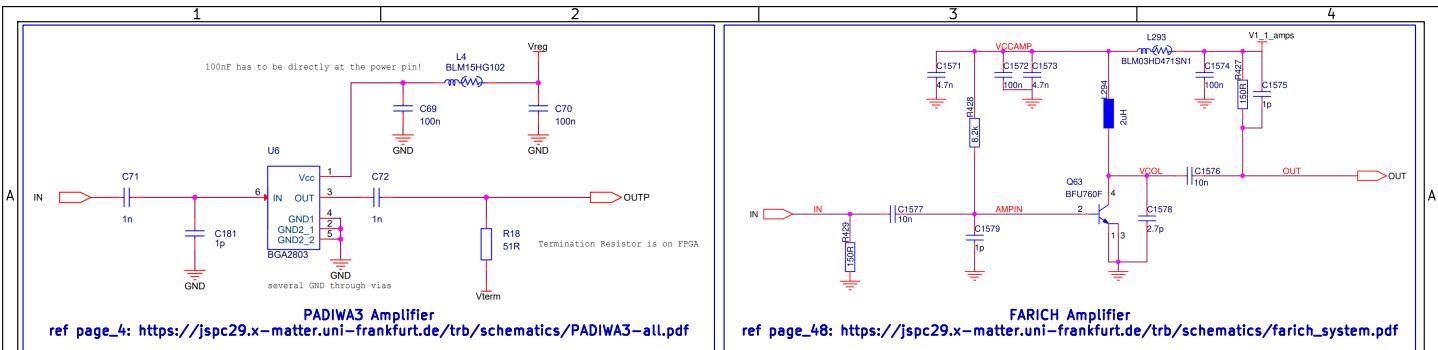
PCB Stackup

Project: HYDRA TPC & Fiber Tracker		TECHNISCHE UNIVERSITÄT DARMSTADT
Author: Dr. Alexandru Enciu		
Institution: Technische Universität Darmstadt		
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<b>Title: Hamamatsu S13552 64 Channels Amplifier</b>		
Size: A5 KiCad E.D.A. 9.0.3	Date:	Rev: Id: 66/66



Other ref:  
 1. W. Zhi et al 2024 JINST 19 P06011  
 DOI 10.1088/1748-0221/19/06/P06011  
 2. Joshua W Cates et al 2018 Phys. Med. Biol. 63 185022  
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 3. F. Simon NIM-A Volume 926, 11 May 2019, Pages 85–100  
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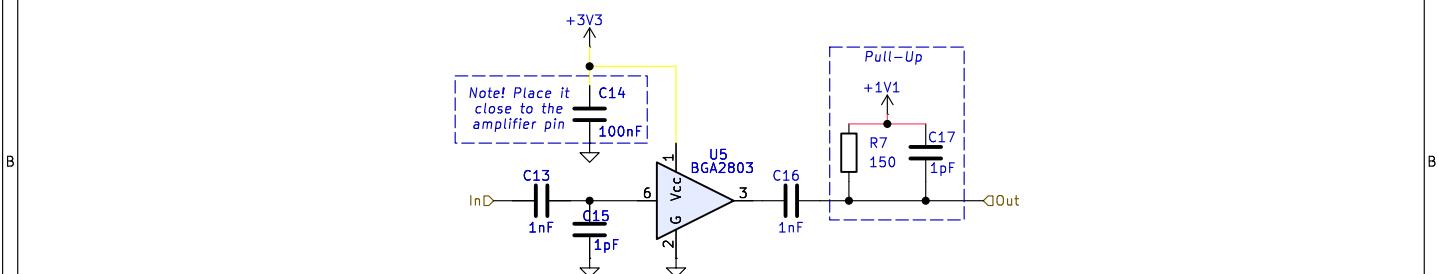
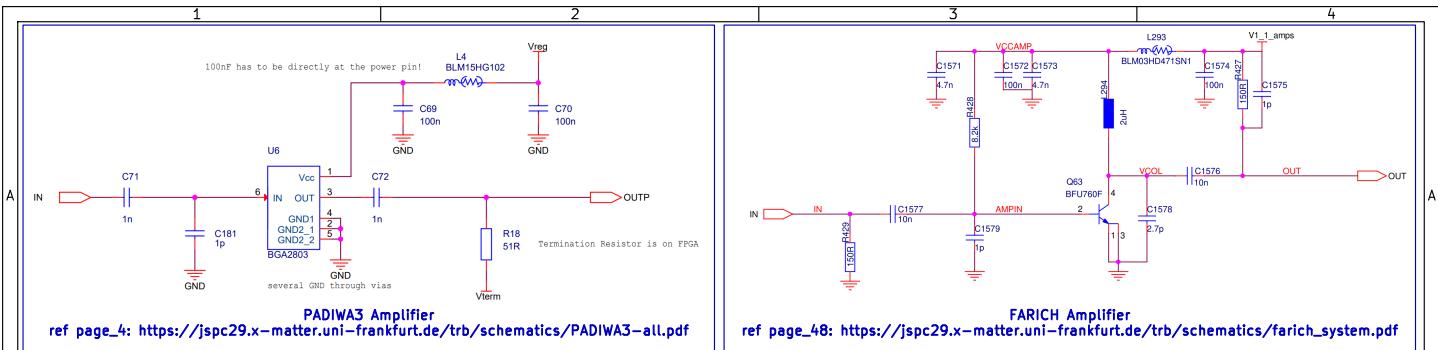
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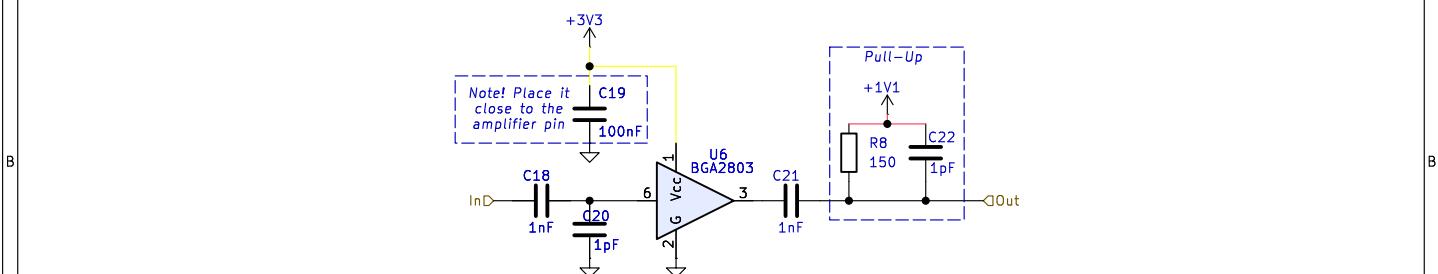
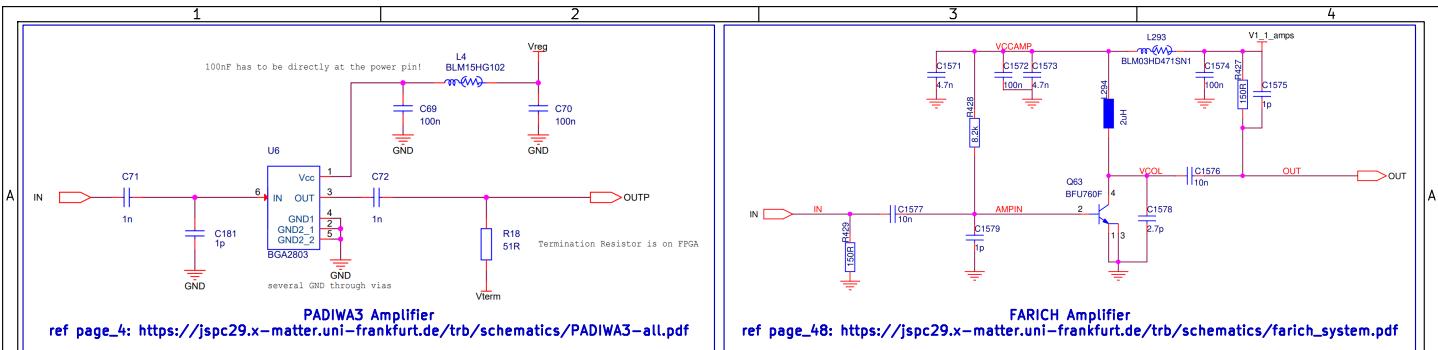
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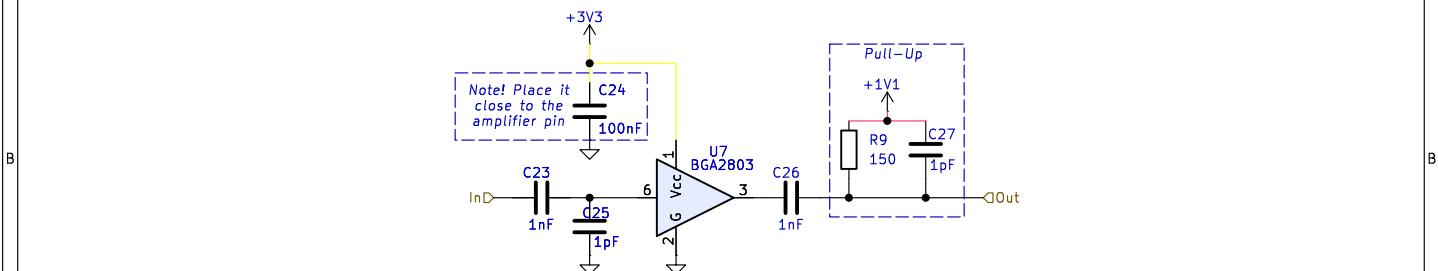
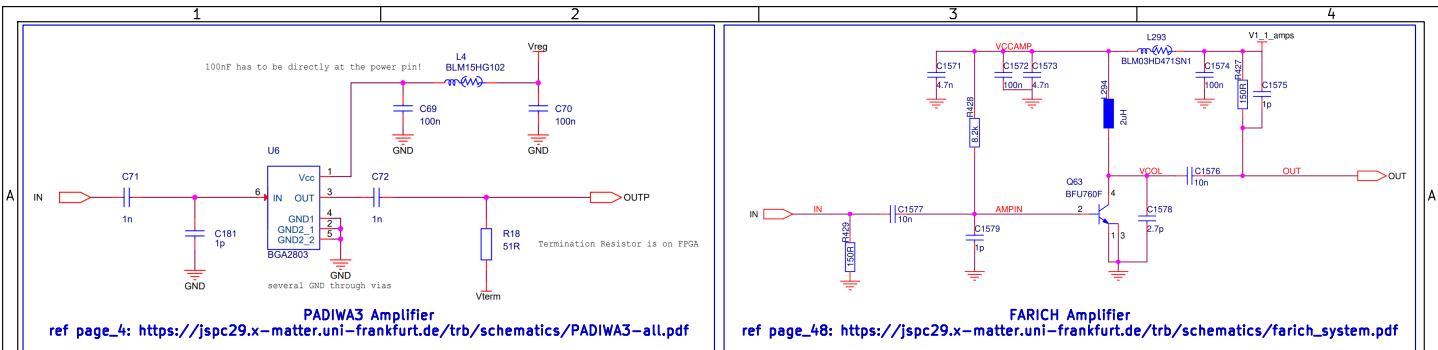
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<p>Project: HYDRA TPC &amp; Fiber Tracker          Author: Dr. Alexandru Enciu          Institution: Technische Universität Darmstadt          Sheet: /amp_3/          File: BGA2803_amplifier.kicad_sch</p>		<p>TECHNISCHE UNIVERSITÄT DARMSTADT</p>	
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<p>Project: HYDRA TPC &amp; Fiber Tracker          Author: Dr. Alexandru Enciu          Institution: Technische Universität Darmstadt</p>			<b>TECHNISCHE UNIVERSITÄT DARMSTADT</b>
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Project: HYDRA TPC & Fiber Tracker  
 Author: Dr. Alexandru Enciu  
 Institution: Technische Universität Darmstadt

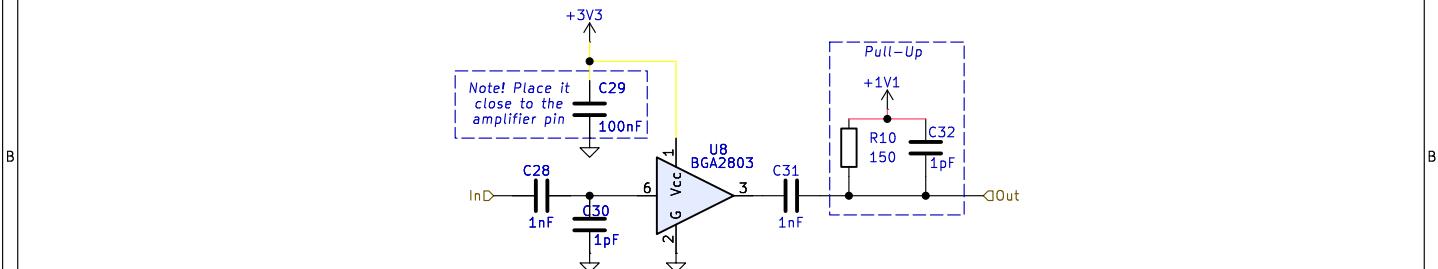
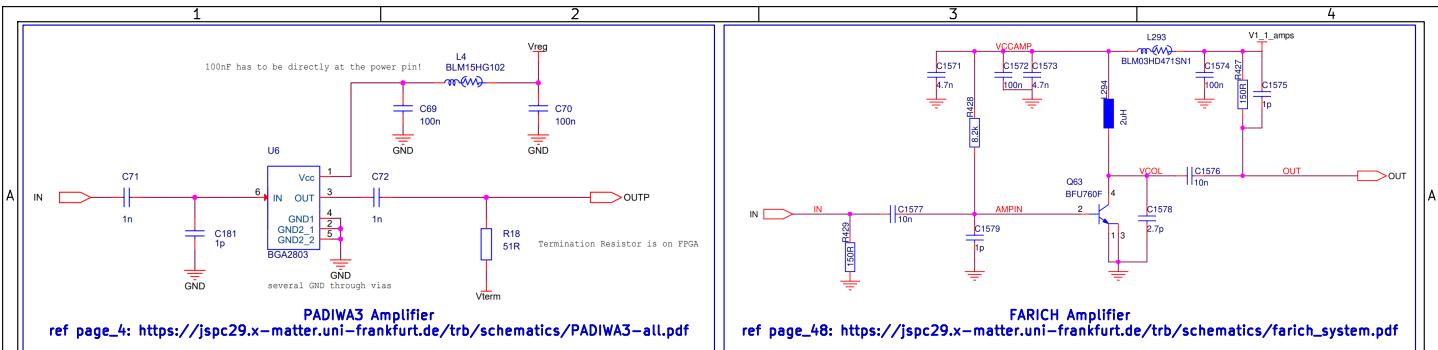


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### Title: Hamamatsu S13552 64 Channels Amplifier

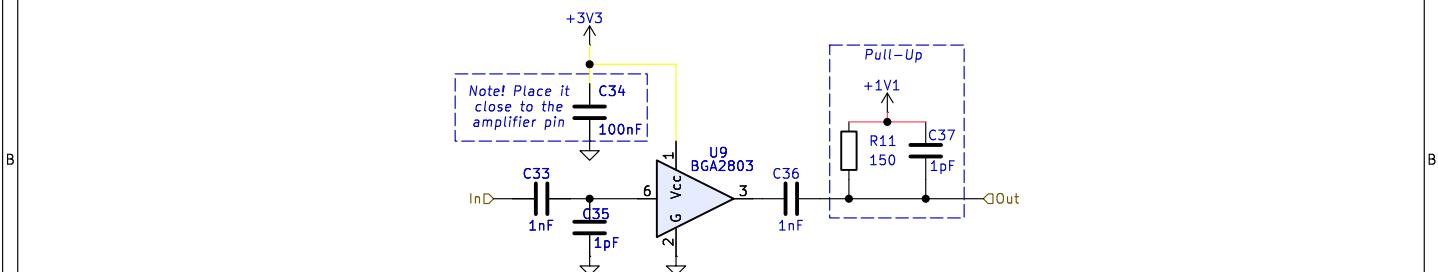
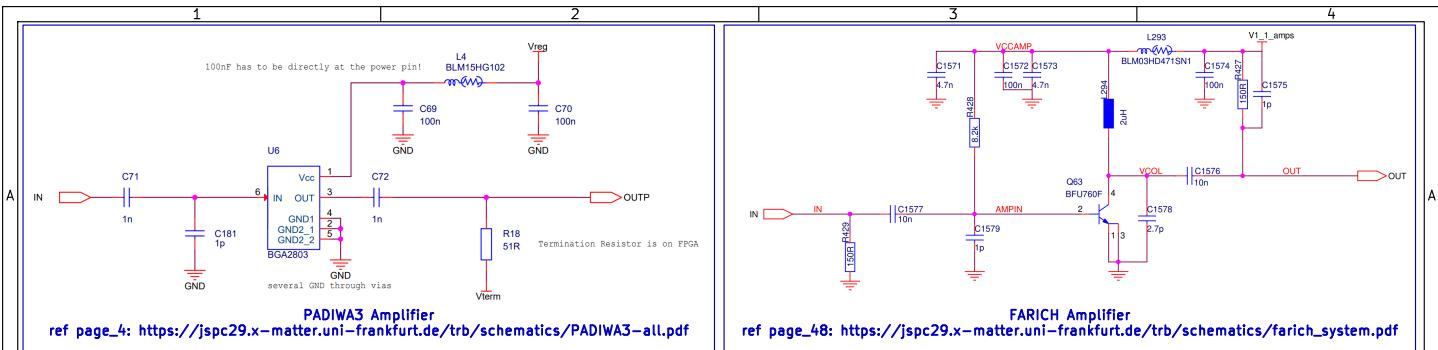
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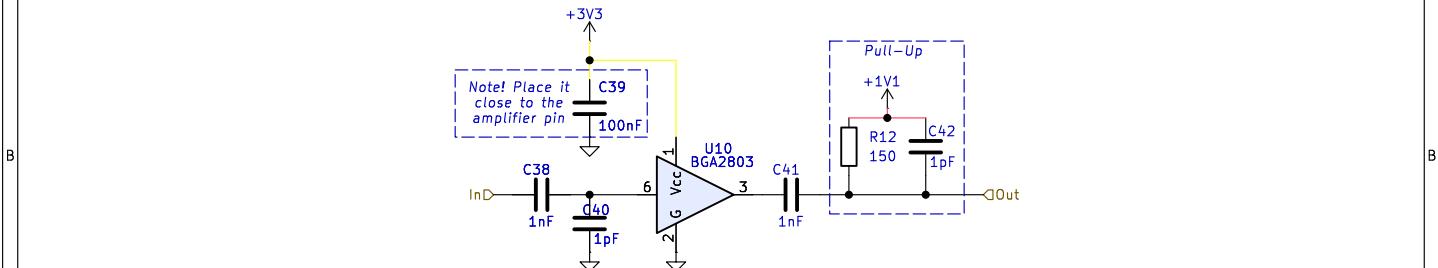
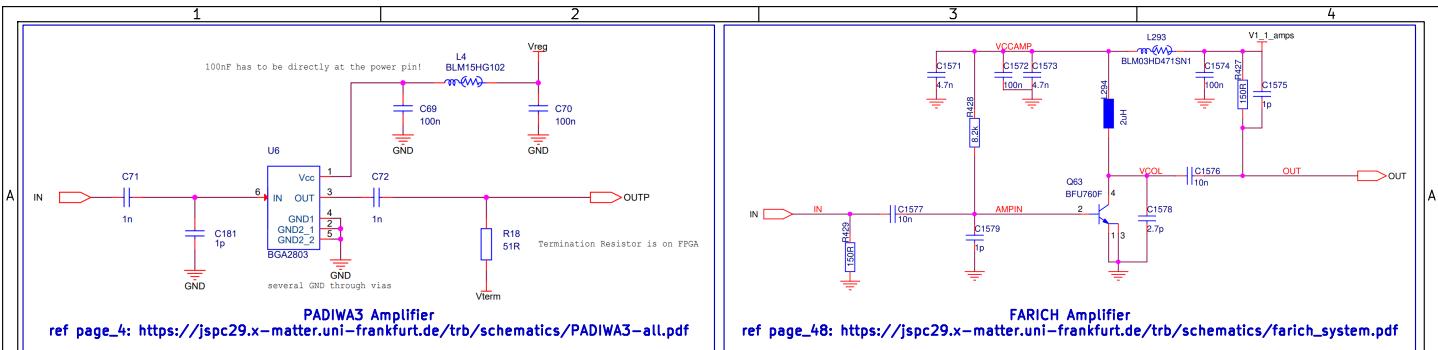
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Project: HYDRA TPC & Fiber Tracker Author: Dr. Alexandru Enciu Institution: Technische Universität Darmstadt		<b>TECHNISCHE UNIVERSITÄT DARMSTADT</b>	
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Project: HYDRA TPC & Fiber Tracker  
 Author: Dr. Alexandru Enciu  
 Institution: Technische Universität Darmstadt

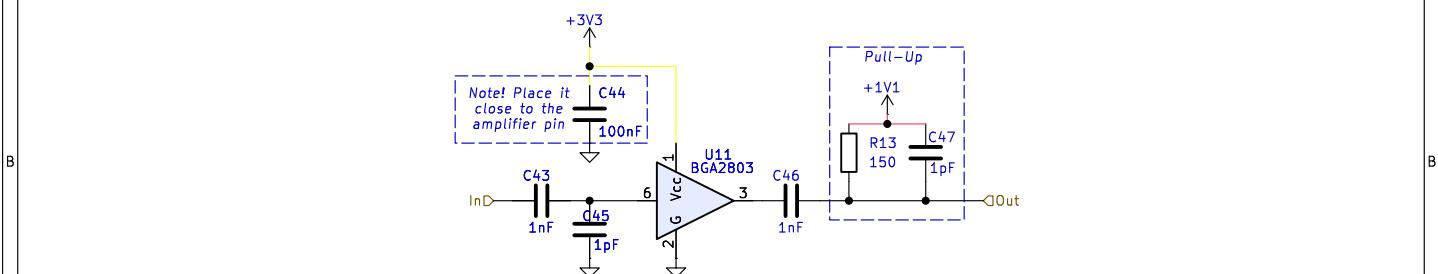
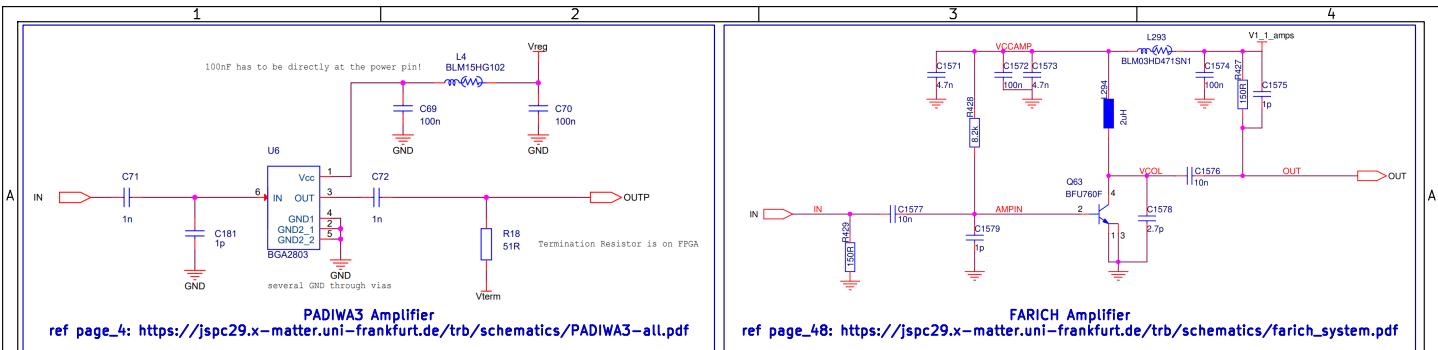


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**Title: Hamamatsu S13552 64 Channels Amplifier**

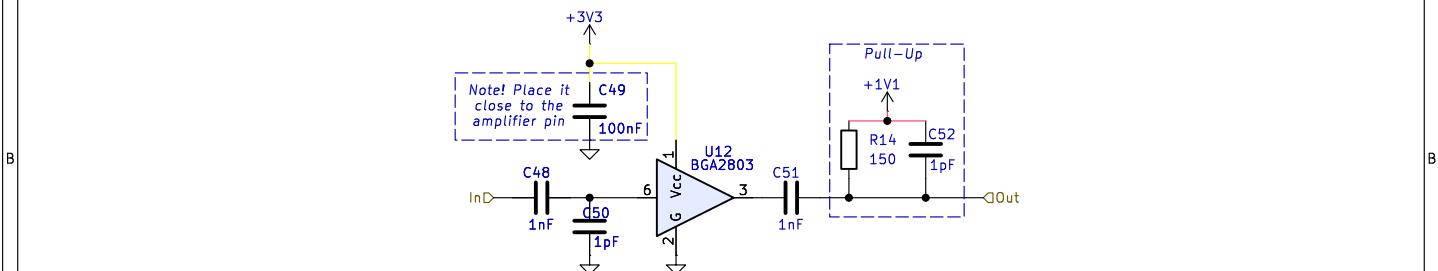
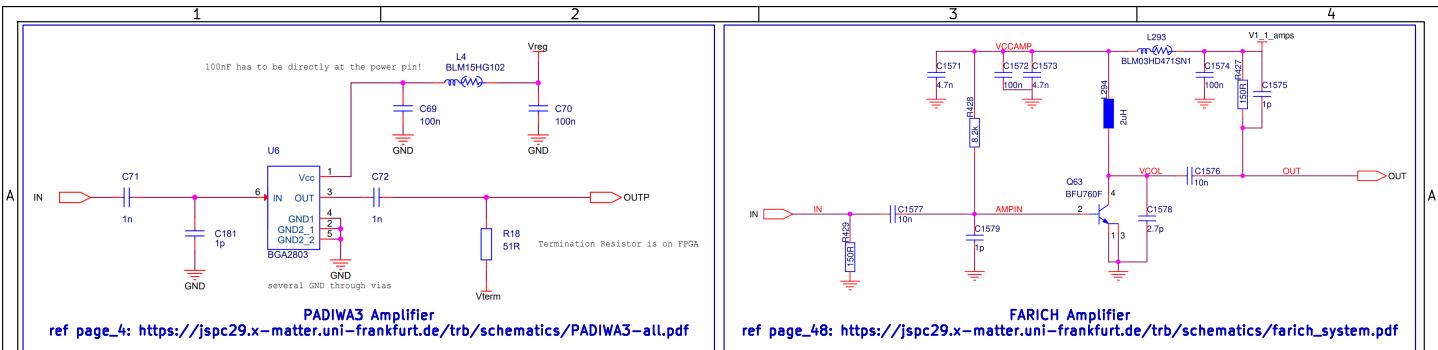
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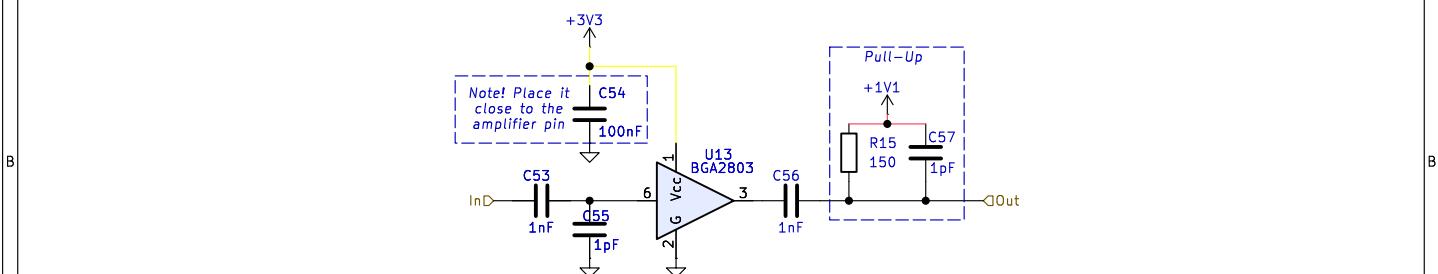
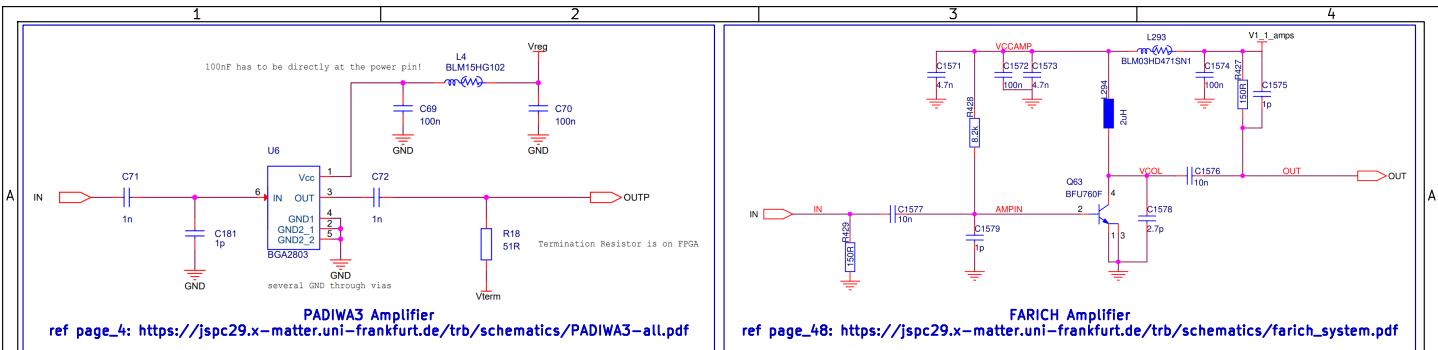
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<p>Project: HYDRA TPC &amp; Fiber Tracker          Author: Dr. Alexandru Enciu          Institution: Technische Universität Darmstadt</p>			<b>TECHNISCHE UNIVERSITÄT DARMSTADT</b>
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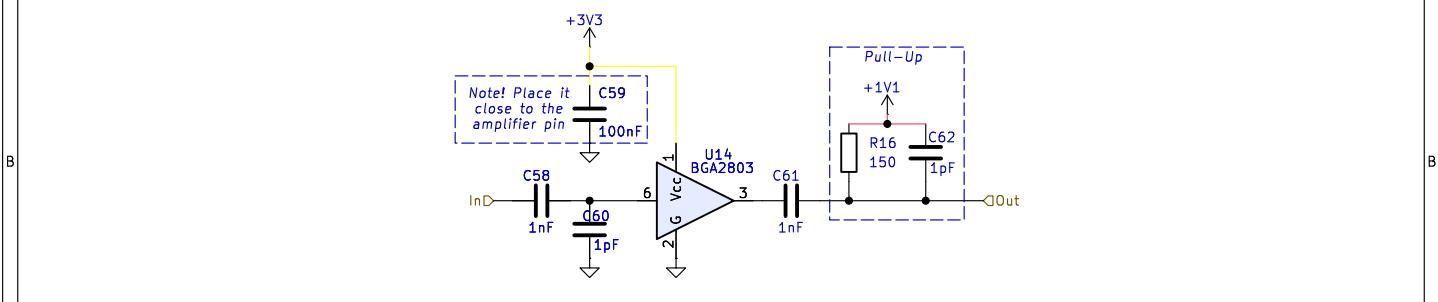
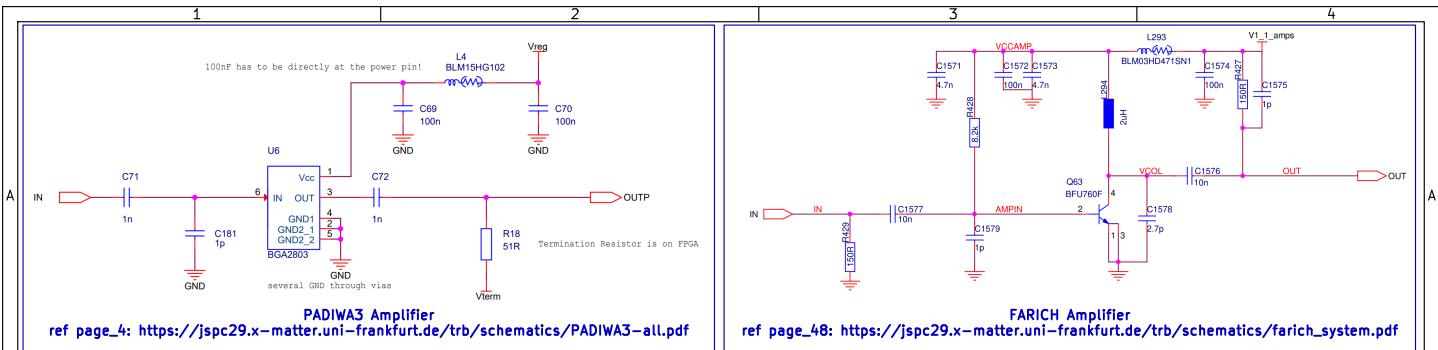
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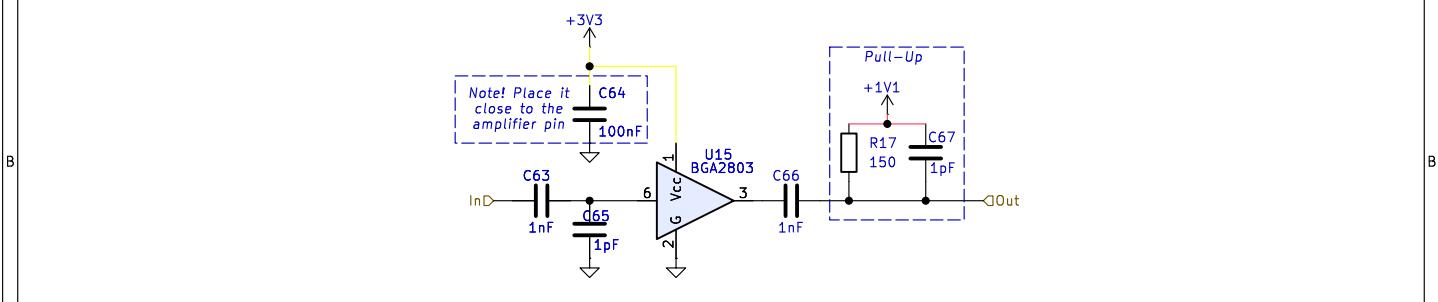
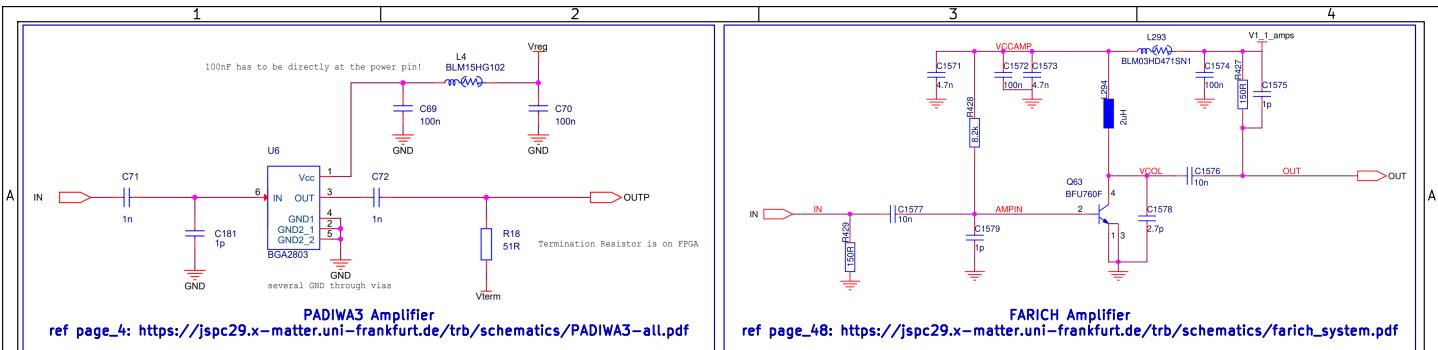
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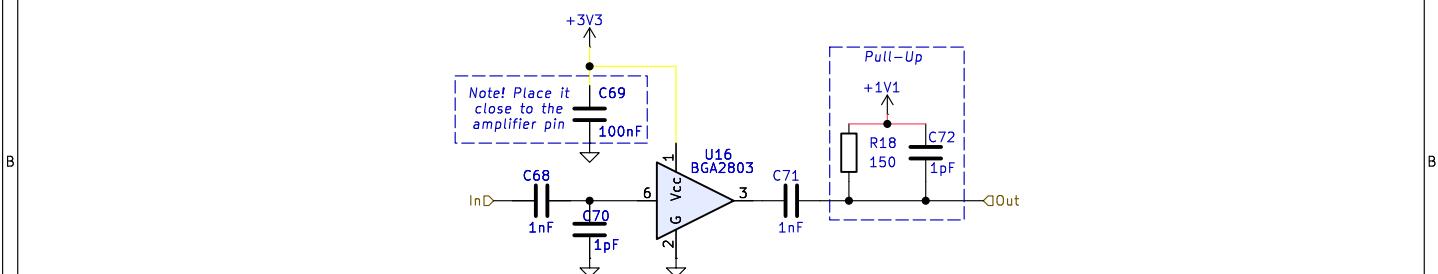
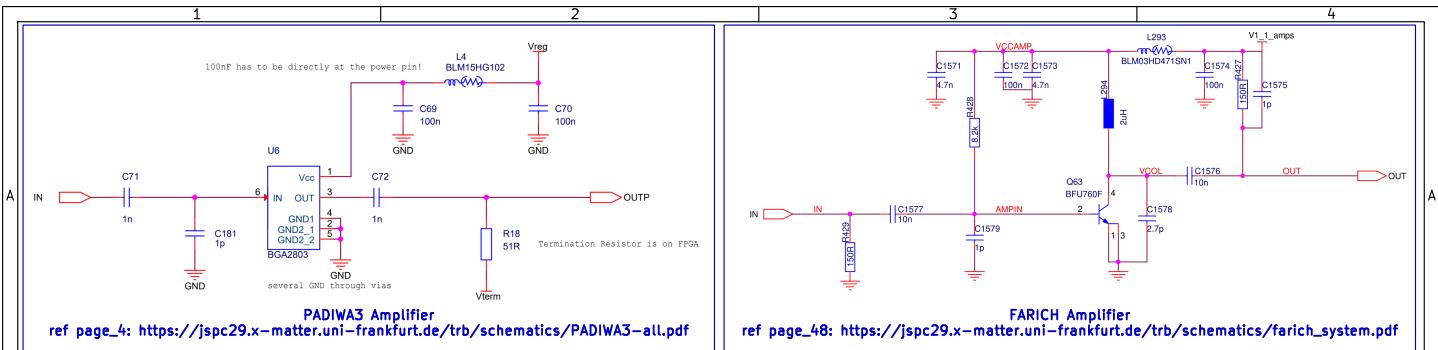
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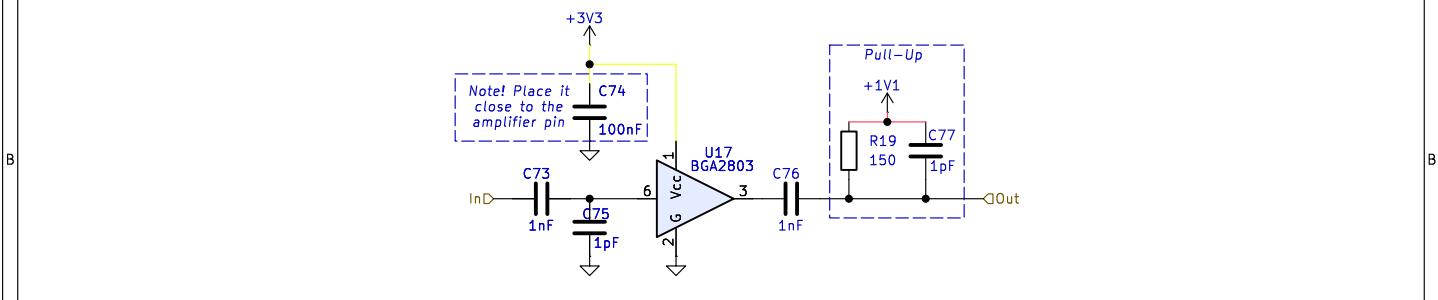
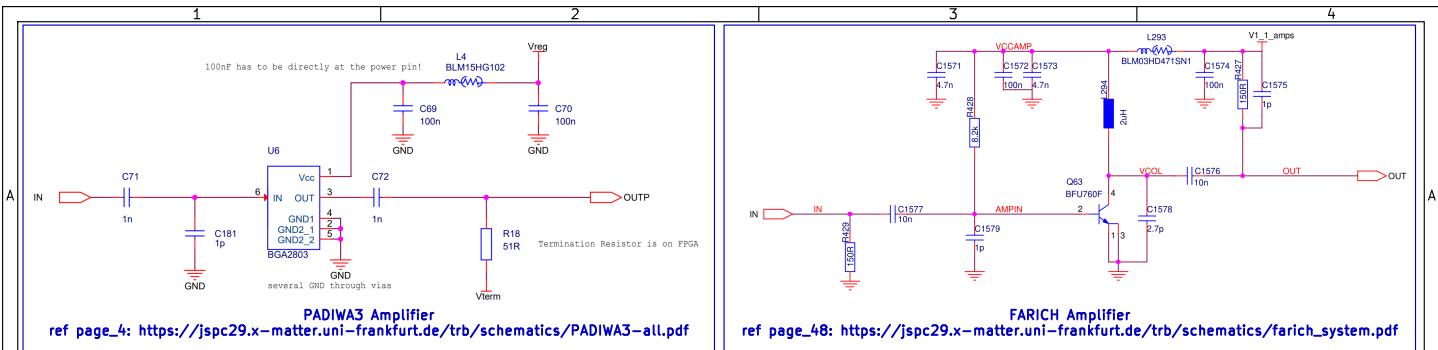
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<p>Project: HYDRA TPC &amp; Fiber Tracker          Author: Dr. Alexandru Enciu          Institution: Technische Universität Darmstadt</p>			<b>TECHNISCHE UNIVERSITÄT DARMSTADT</b>
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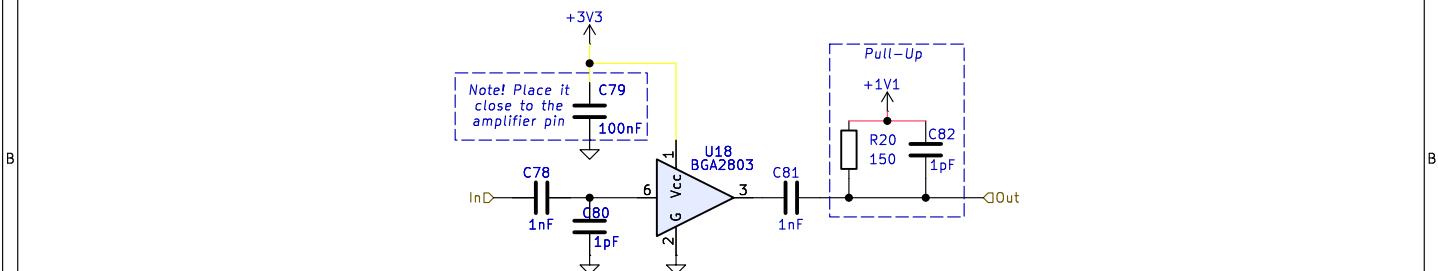
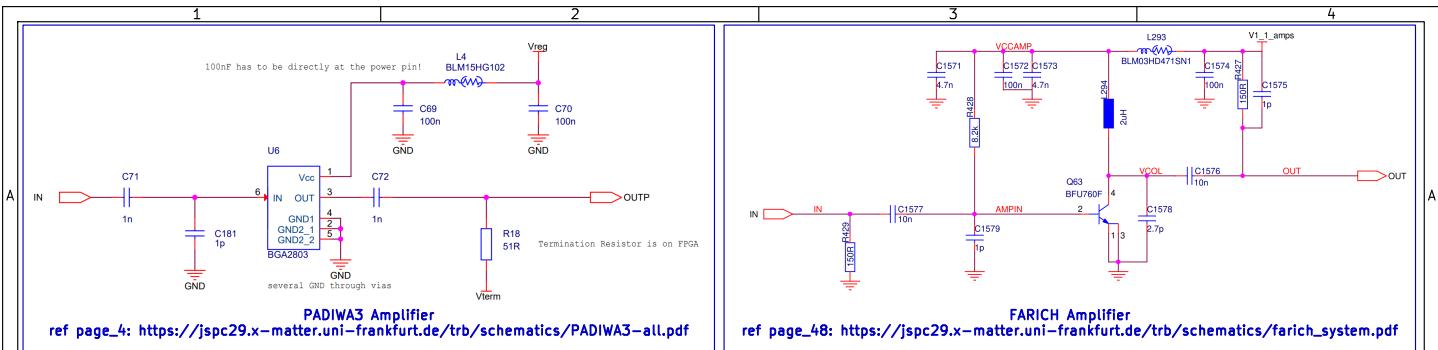
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 Institution: Technische Universität Darmstadt



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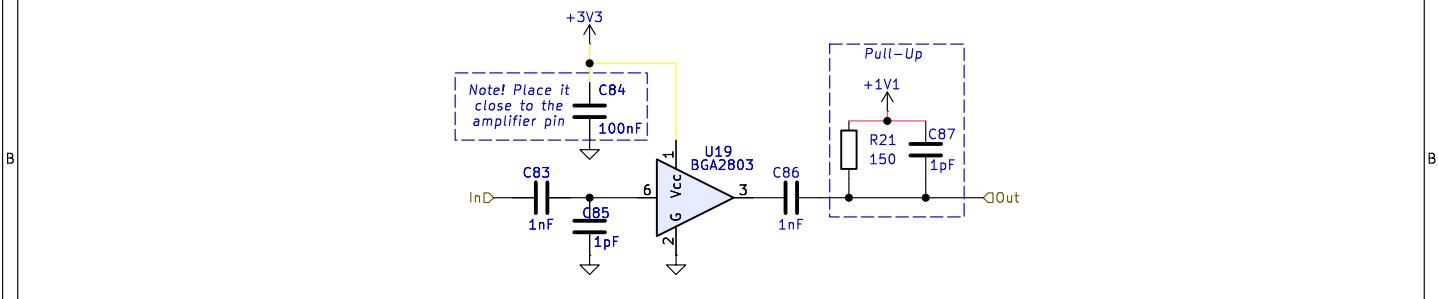
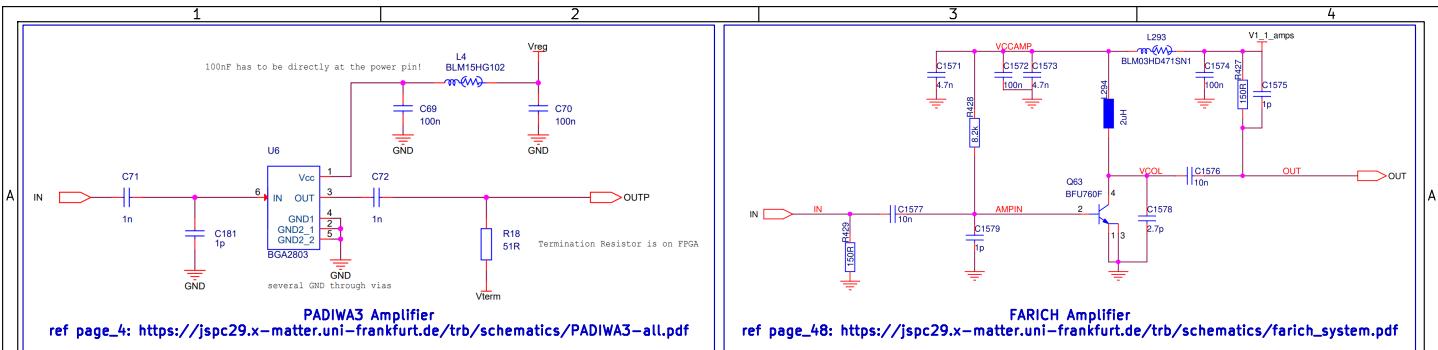
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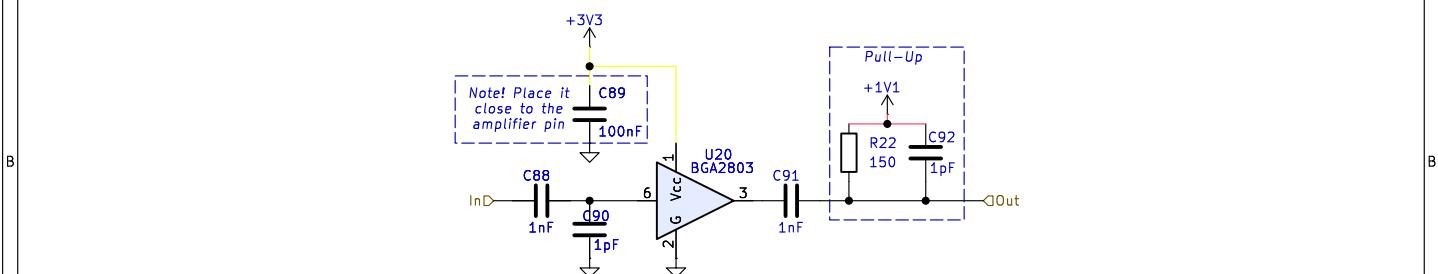
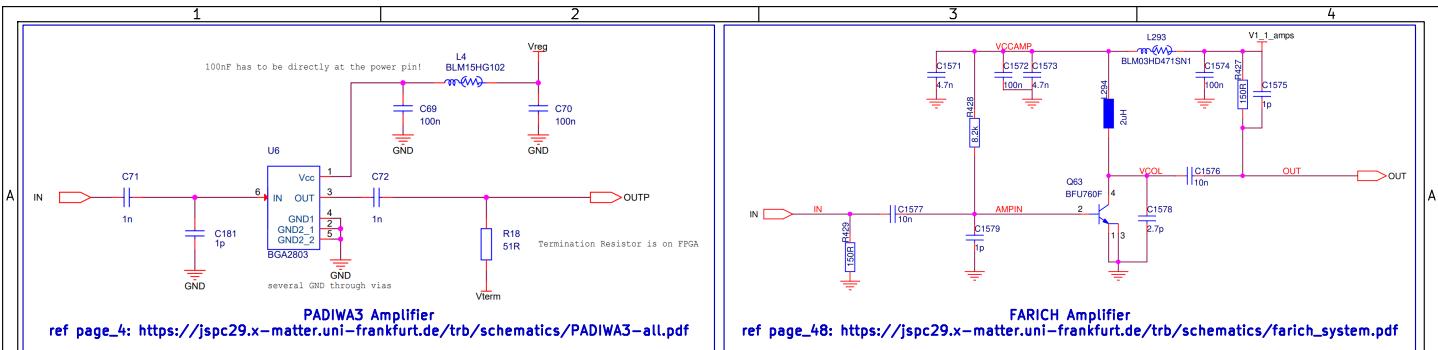
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<p>Project: HYDRA TPC &amp; Fiber Tracker          Author: Dr. Alexandru Enciu          Institution: Technische Universität Darmstadt</p>		<p>TECHNISCHE UNIVERSITÄT DARMSTADT</p>	
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<p><b>Title: Hamamatsu S13552 64 Channels Amplifier</b></p>			
Size: A5	Date: 2025-03-25	Rev: 0	
KiCad E.D.A. 9.0.3			Id: 17/66



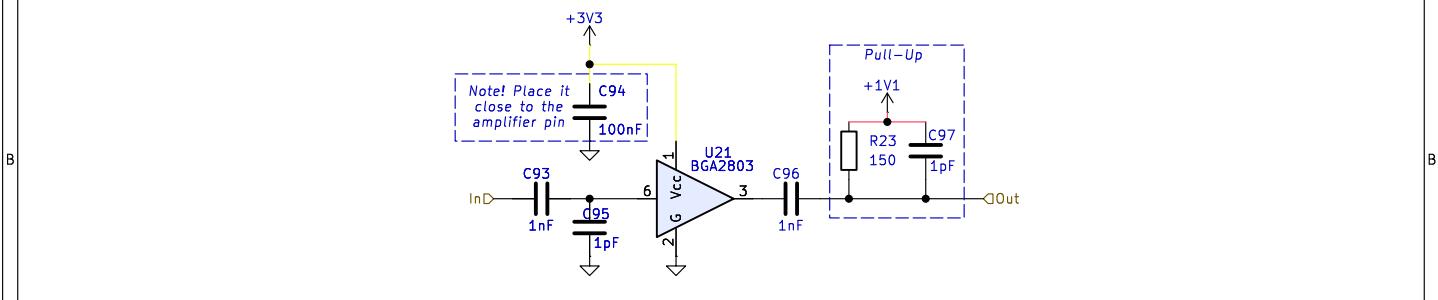
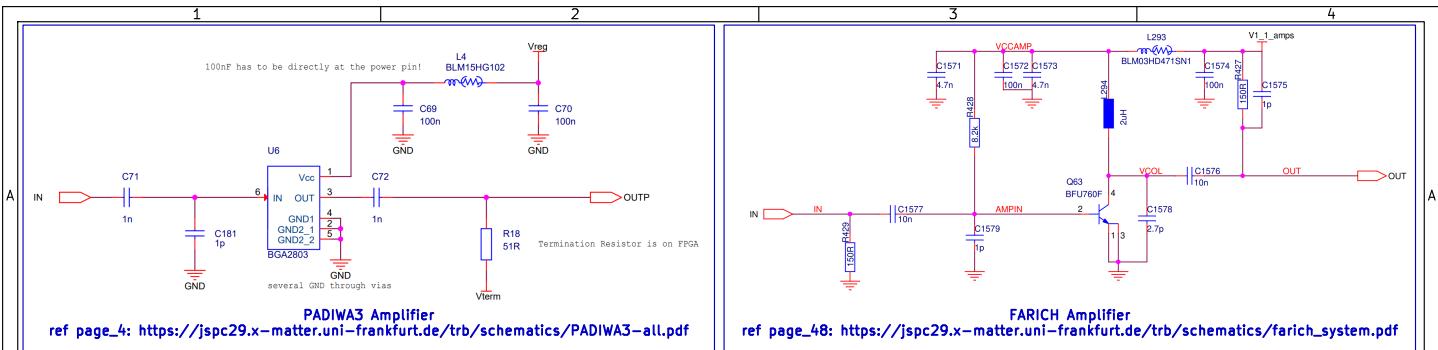
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 1. W. Zhi et al 2024 JINST 19 P06011  
 DOI 10.1088/1748-0221/19/06/P06011  
 2. Joshua W Cates et al 2018 Phys. Med. Biol. 63 185022  
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 3. F. Simon NIM-A Volume 926, 11 May 2019, Pages 85–100  
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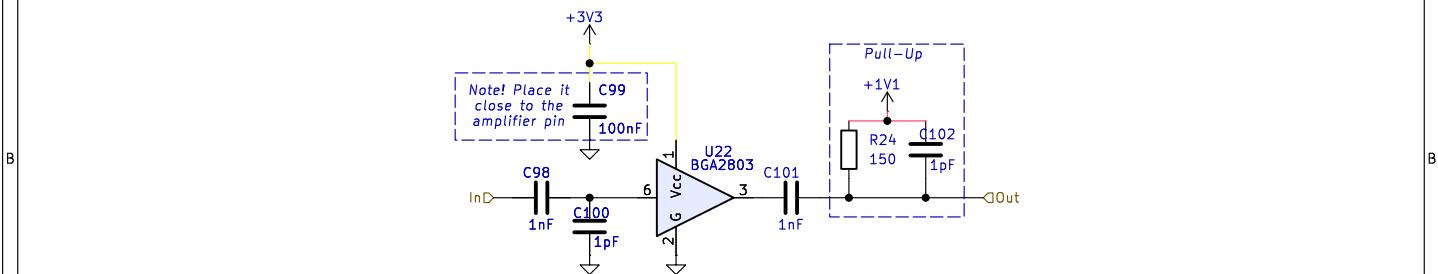
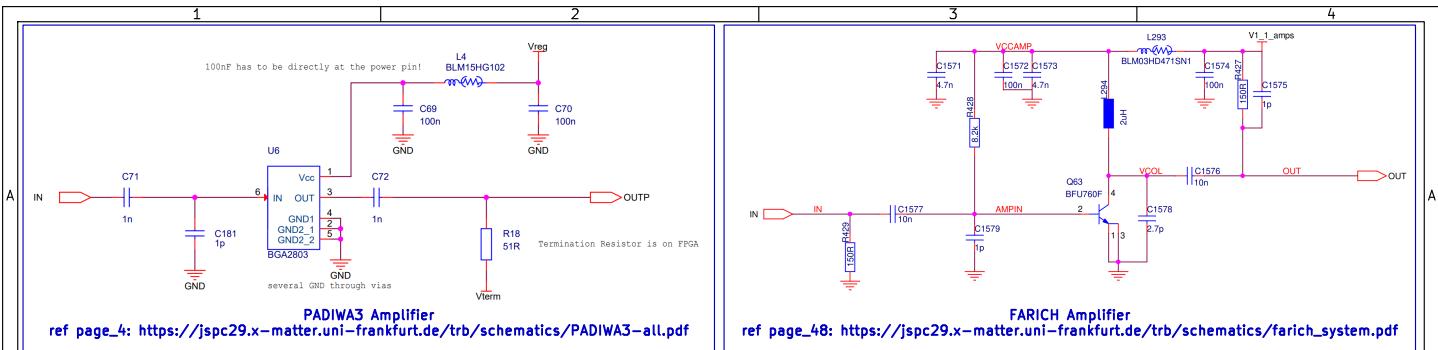
Project: HYDRA TPC & Fiber Tracker Author: Dr. Alexandru Enciu Institution: Technische Universität Darmstadt Sheet: /amp_17/ File: BGA2803_amplifier.kicad_sch			<b>TECHNISCHE UNIVERSITÄT DARMSTADT</b>
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Other ref:  
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 2. Joshua W Cates et al 2018 Phys. Med. Biol. 63 185022  
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<p>Project: HYDRA TPC &amp; Fiber Tracker          Author: Dr. Alexandru Enciu          Institution: Technische Universität Darmstadt          Sheet: /amp_18/          File: BGA2803_amplifier.kicad_sch</p>		<p>TECHNISCHE UNIVERSITÄT DARMSTADT</p>	
<p><b>Title: Hamamatsu S13552 64 Channels Amplifier</b>          Size: A5      Date: 2025-03-25          KiCad E.D.A. 9.0.3</p>		<p>Rev: 0          Id: 19/66</p>	





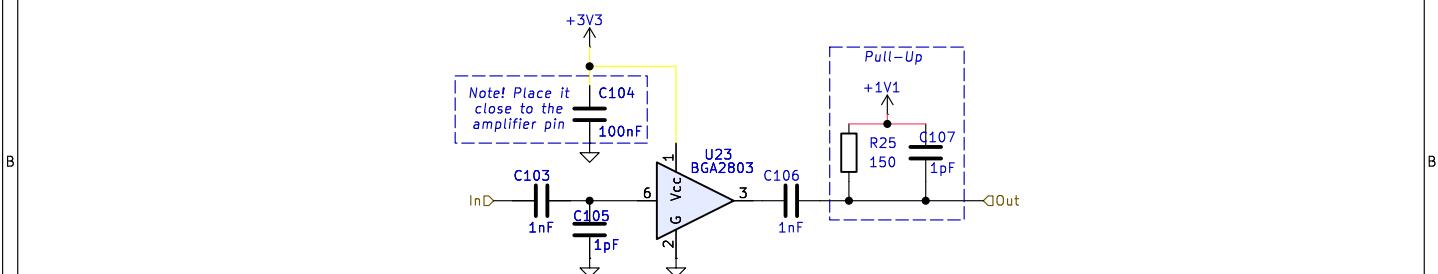
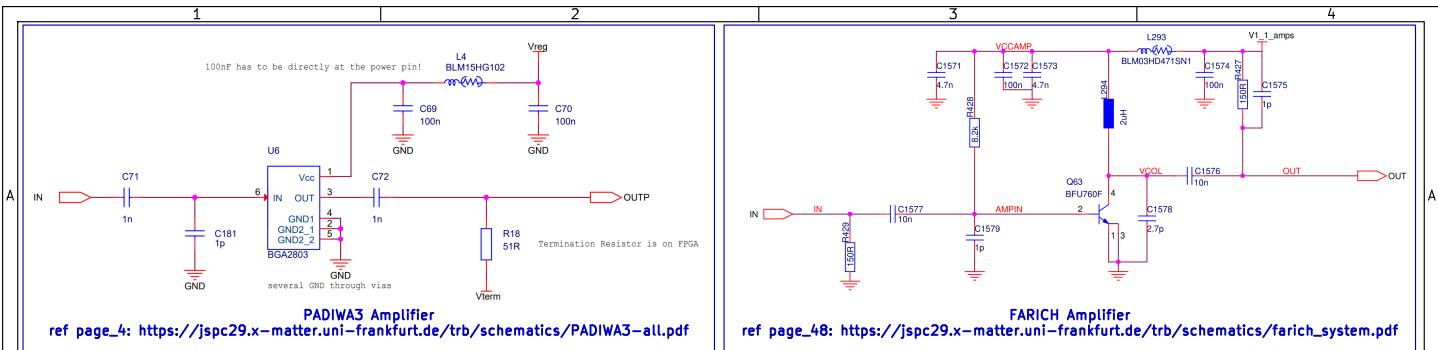
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Project: HYDRA TPC & Fiber Tracker  
 Author: Dr. Alexandru Enciu  
 Institution: Technische Universität Darmstadt



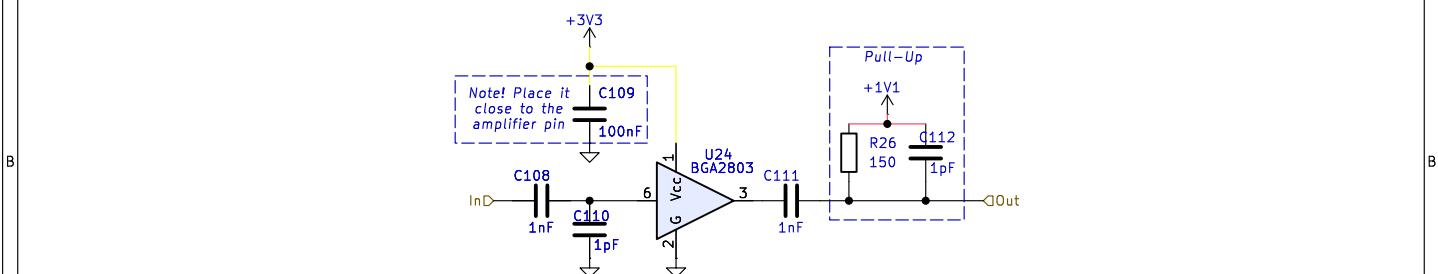
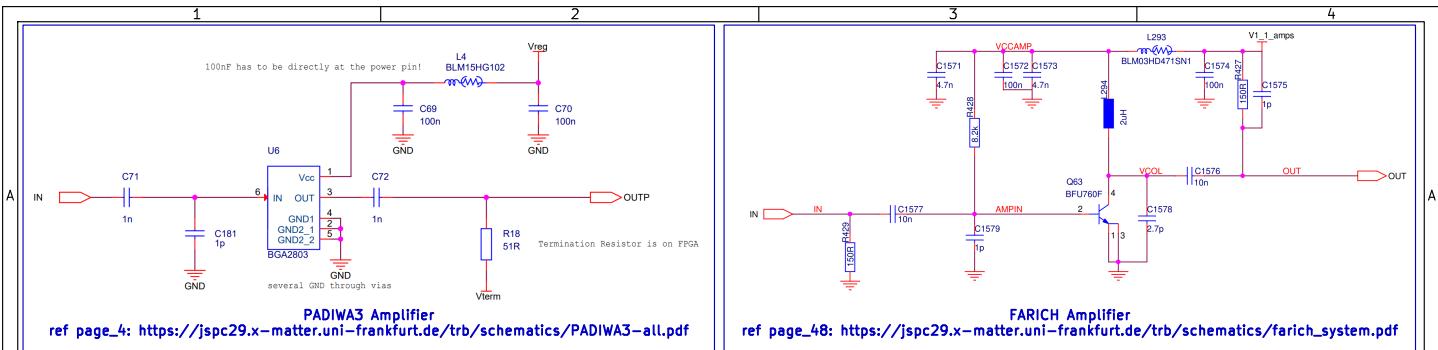
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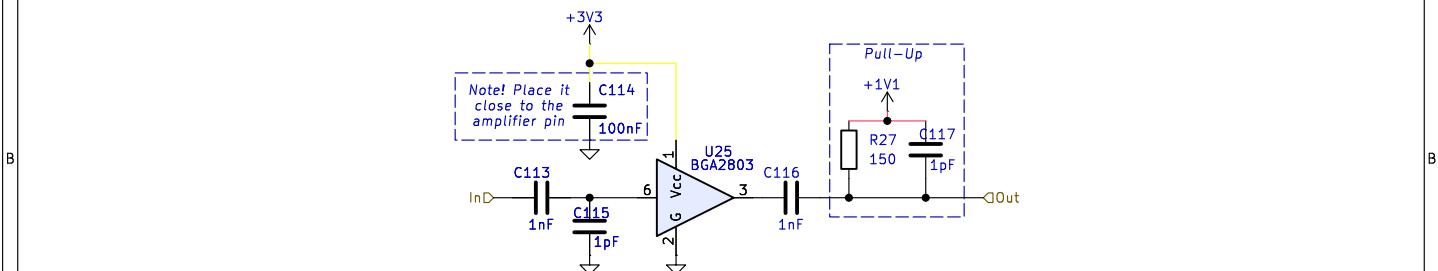
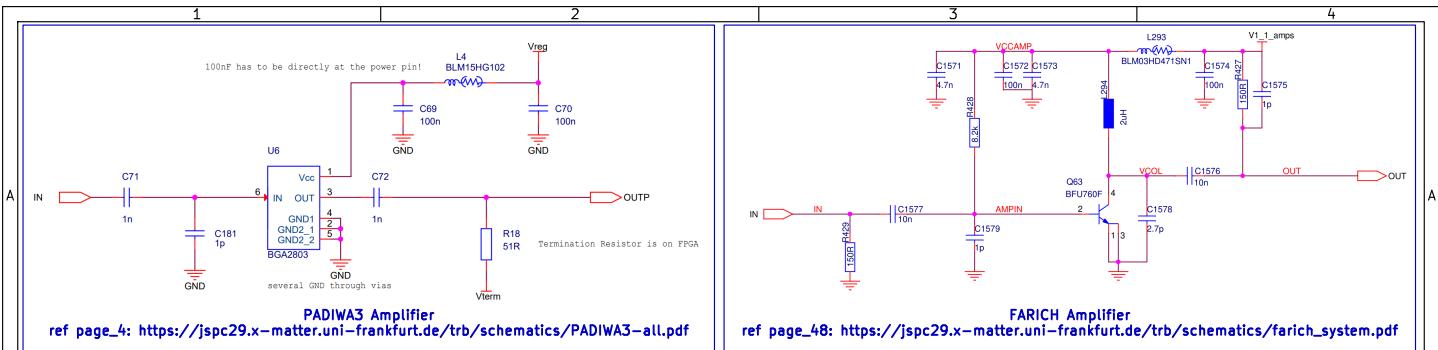
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<p>Project: HYDRA TPC &amp; Fiber Tracker          Author: Dr. Alexandru Enciu          Institution: Technische Universität Darmstadt</p>			<b>TECHNISCHE UNIVERSITÄT DARMSTADT</b>
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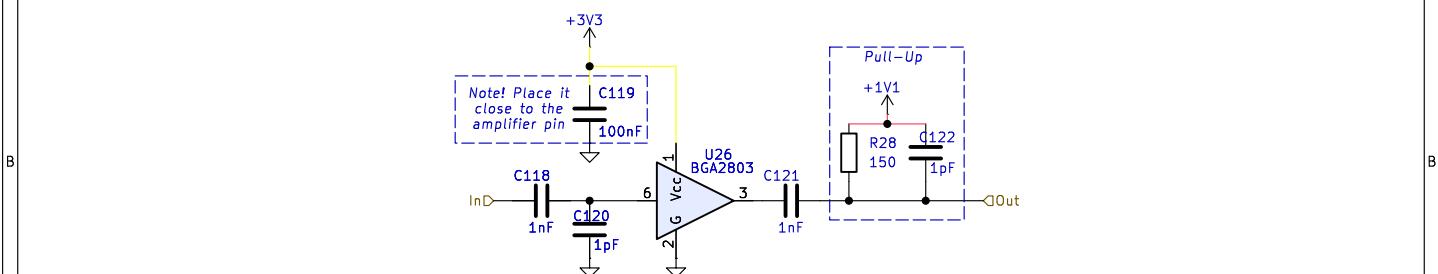
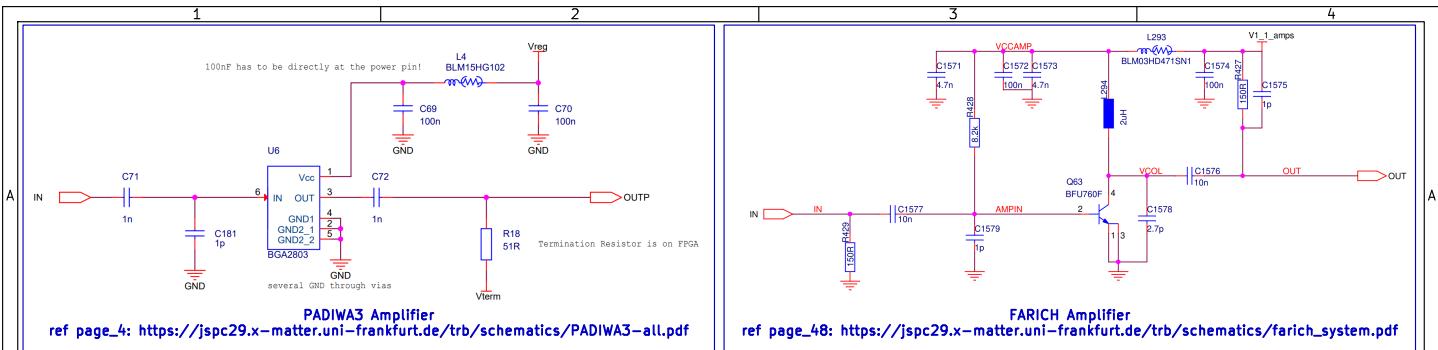
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Project: HYDRA TPC & Fiber Tracker Author: Dr. Alexandru Enciu Institution: Technische Universität Darmstadt Sheet: /amp_22/ File: BGA2803_amplifier.kicad_sch		<b>TECHNISCHE UNIVERSITÄT DARMSTADT</b>	
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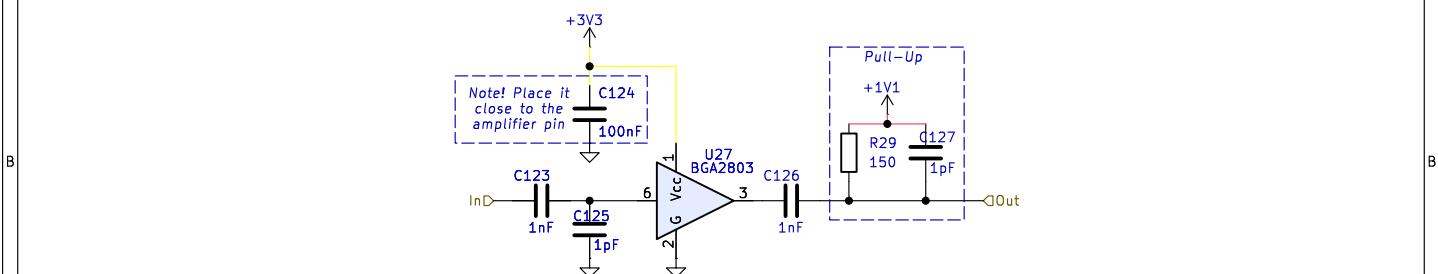
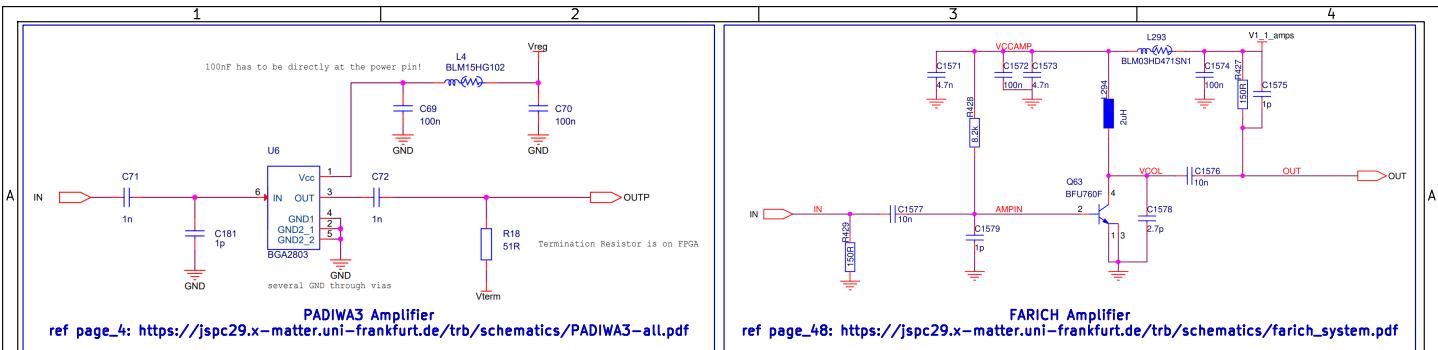
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<p>Project: HYDRA TPC &amp; Fiber Tracker          Author: Dr. Alexandru Enciu          Institution: Technische Universität Darmstadt</p>			<b>TECHNISCHE UNIVERSITÄT DARMSTADT</b>
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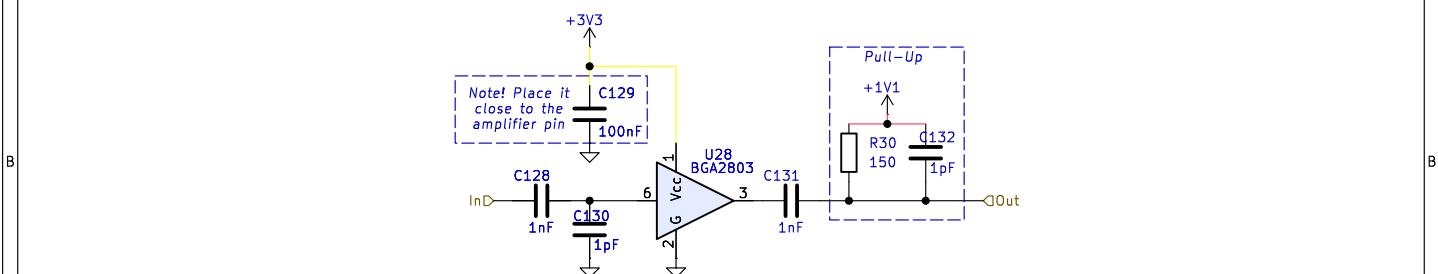
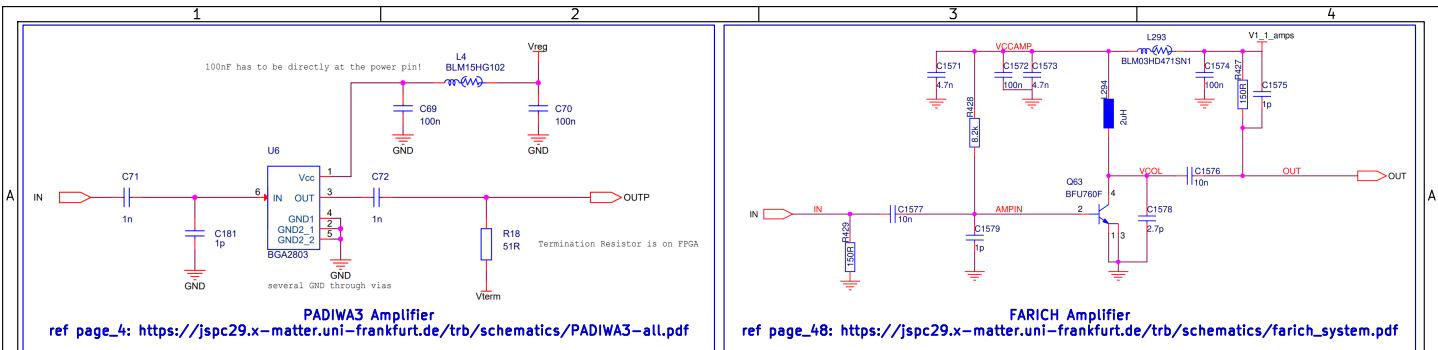
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		<b>TECHNISCHE UNIVERSITÄT DARMSTADT</b>	
		Project: HYDRA TPC & Fiber Tracker Author: Dr. Alexandru Enciu Institution: Technische Universität Darmstadt Sheet: /amp_24/ File: BGA2803_amplifier.kicad_sch	
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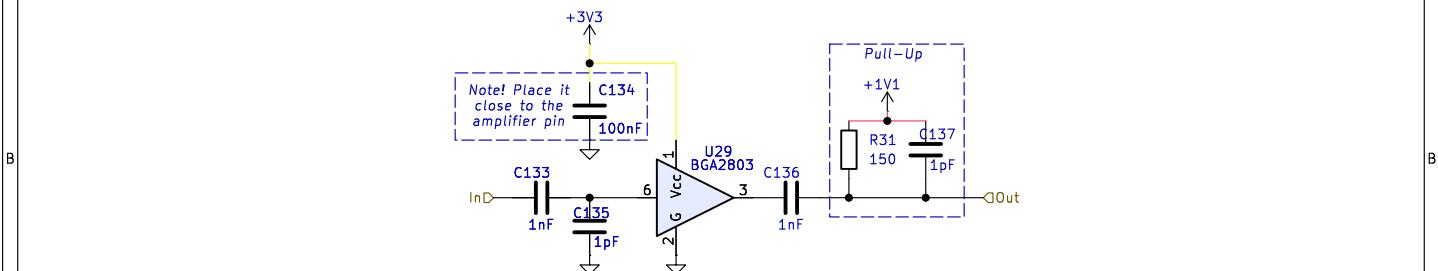
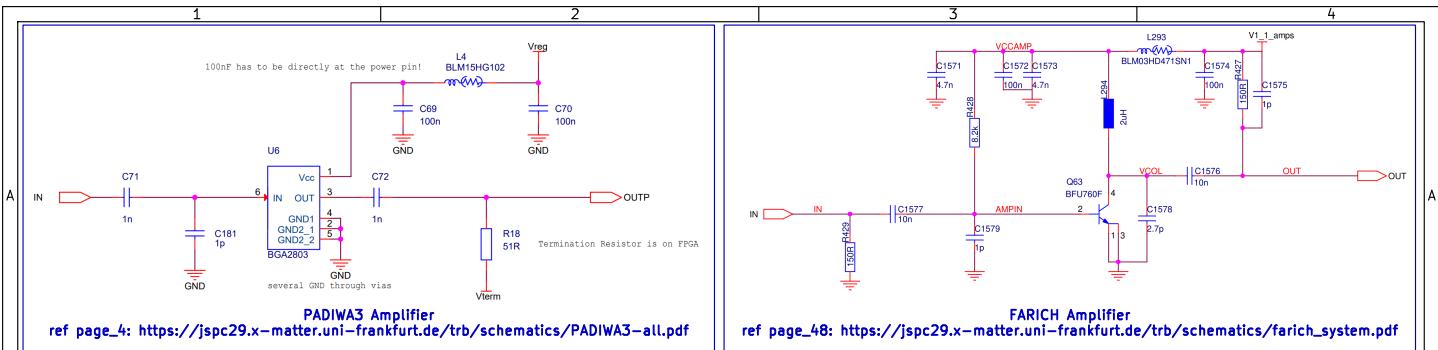
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<p>Project: HYDRA TPC &amp; Fiber Tracker          Author: Dr. Alexandru Enciu          Institution: Technische Universität Darmstadt</p>			<b>TECHNISCHE UNIVERSITÄT DARMSTADT</b>
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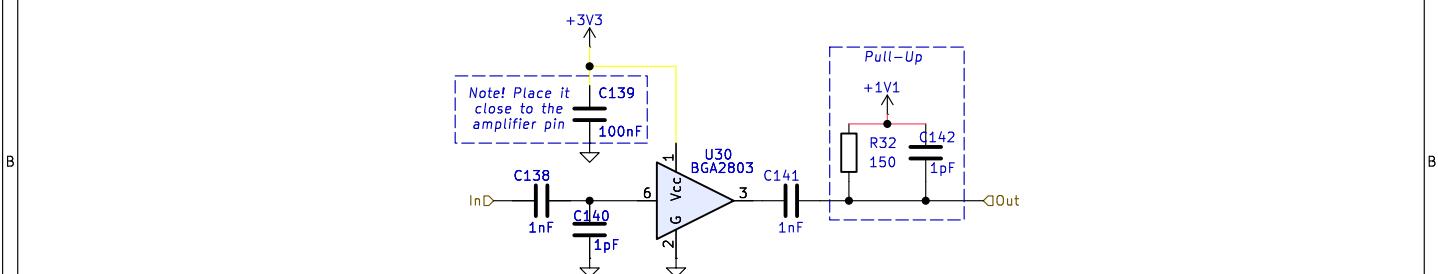
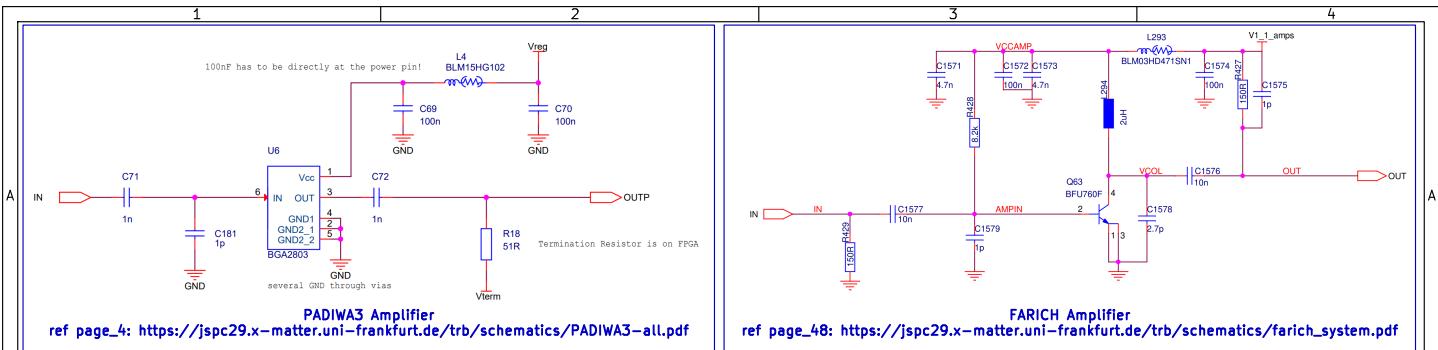
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Project: HYDRA TPC & Fiber Tracker Author: Dr. Alexandru Enciu Institution: Technische Universität Darmstadt Sheet: /amp_26/ File: BGA2803_amplifier.kicad_sch		<b>TECHNISCHE UNIVERSITÄT DARMSTADT</b>	
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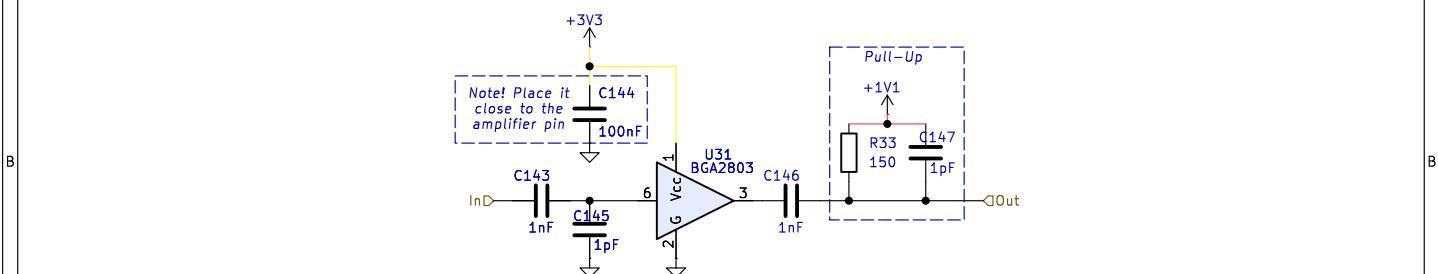
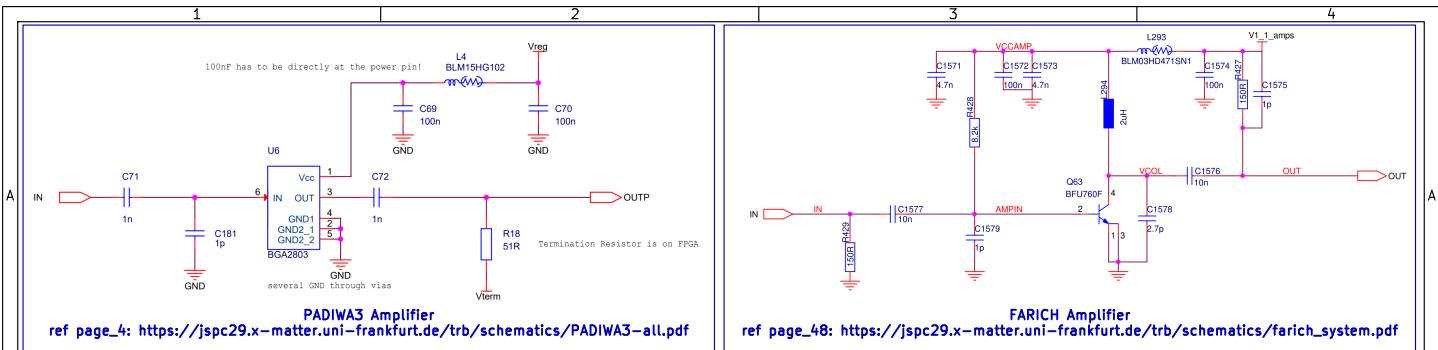
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<p>Project: HYDRA TPC &amp; Fiber Tracker          Author: Dr. Alexandru Enciu          Institution: Technische Universität Darmstadt          Sheet: /amp_27/          File: BGA2803_amplifier.kicad_sch</p>		<p>TECHNISCHE UNIVERSITÄT DARMSTADT</p>	
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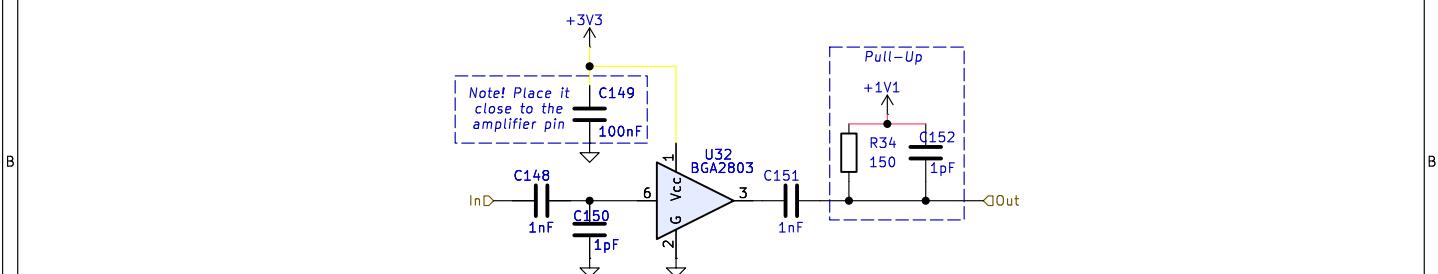
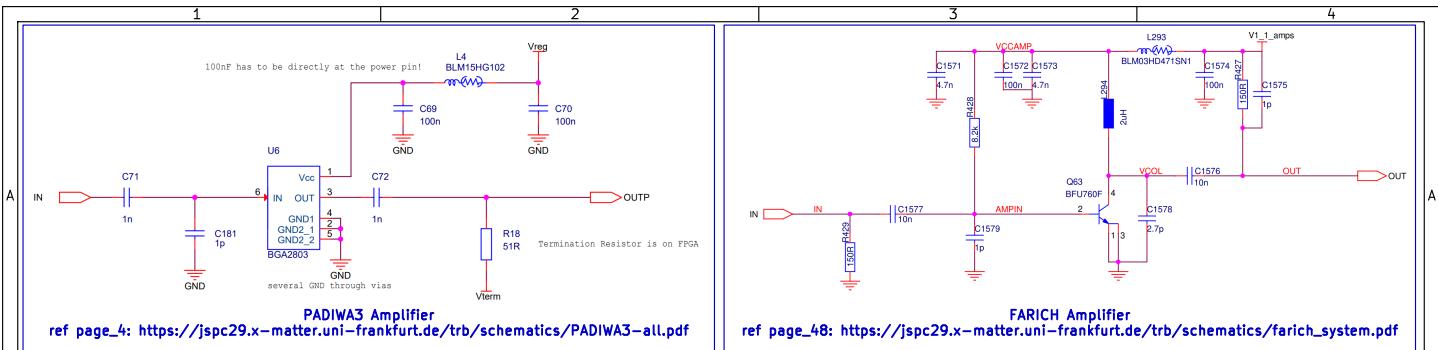
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Project: HYDRA TPC & Fiber Tracker Author: Dr. Alexandru Enciu Institution: Technische Universität Darmstadt Sheet: /amp_28/ File: BGA2803_amplifier.kicad_sch		<b>TECHNISCHE UNIVERSITÄT DARMSTADT</b>	
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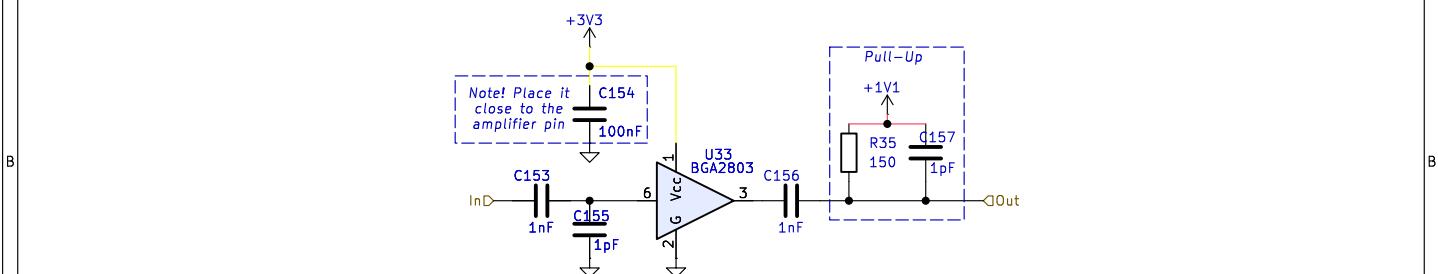
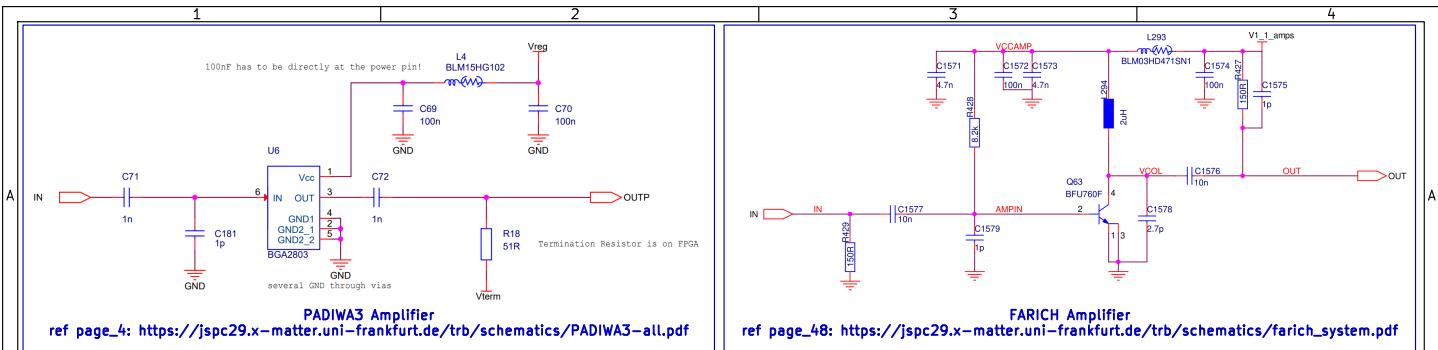
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<p>Project: HYDRA TPC &amp; Fiber Tracker          Author: Dr. Alexandru Enciu          Institution: Technische Universität Darmstadt          Sheet: /amp_29/          File: BGA2803_amplifier.kicad_sch</p>		<p>TECHNISCHE UNIVERSITÄT DARMSTADT</p>	
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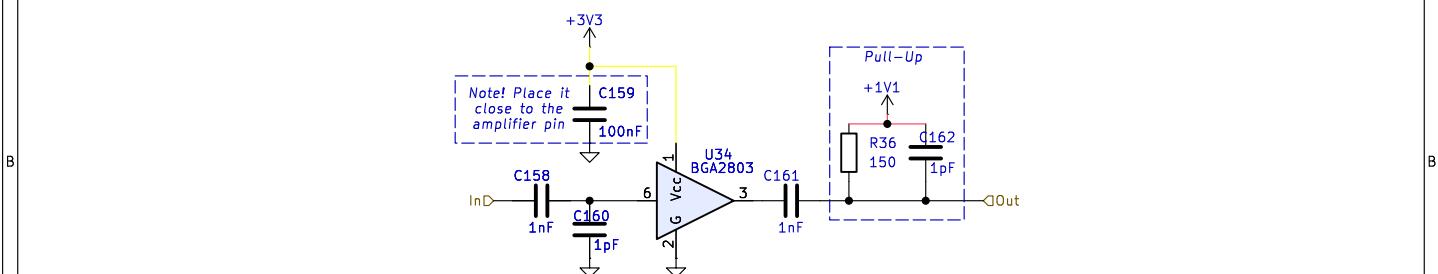
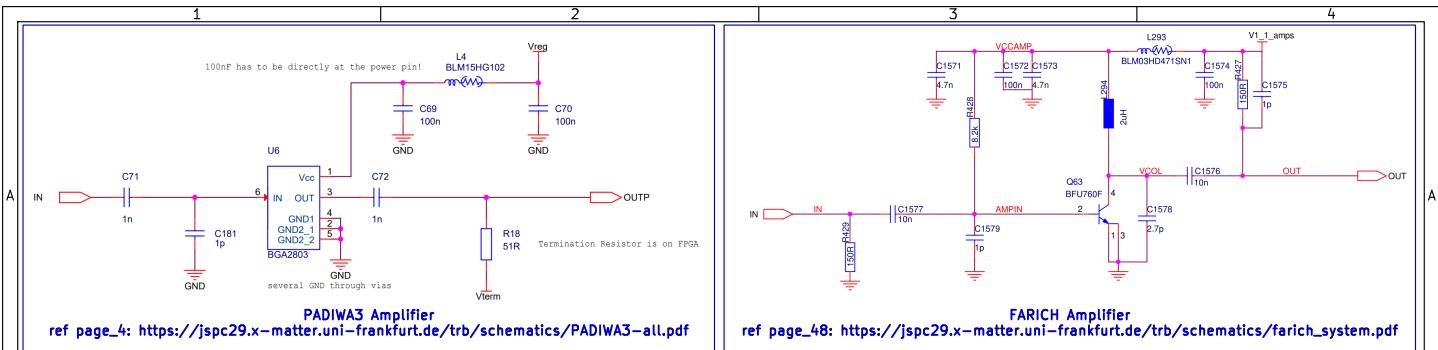
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Project: HYDRA TPC & Fiber Tracker Author: Dr. Alexandru Enciu Institution: Technische Universität Darmstadt Sheet: /amp_30/ File: BGA2803_amplifier.kicad_sch		<b>TECHNISCHE UNIVERSITÄT DARMSTADT</b>	
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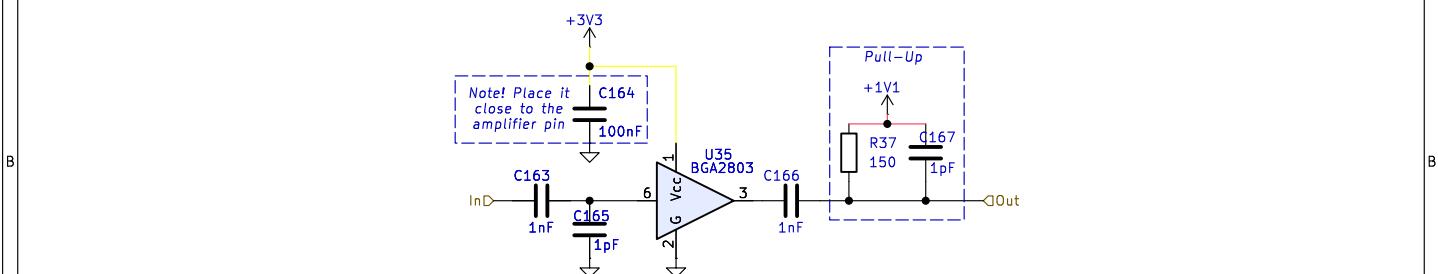
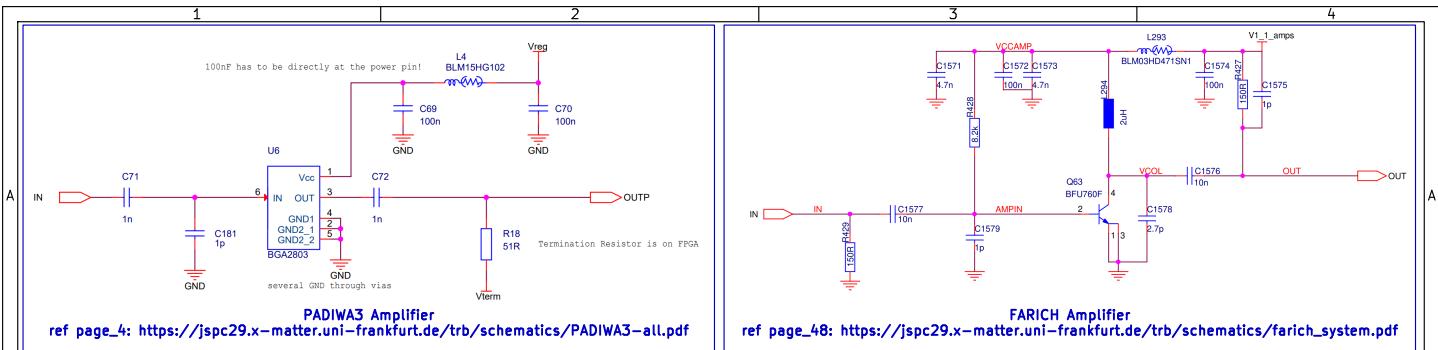
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<p>Project: HYDRA TPC &amp; Fiber Tracker          Author: Dr. Alexandru Enciu          Institution: Technische Universität Darmstadt          Sheet: /amp_31/          File: BGA2803_amplifier.kicad_sch</p>		<p>TECHNISCHE UNIVERSITÄT DARMSTADT</p>	
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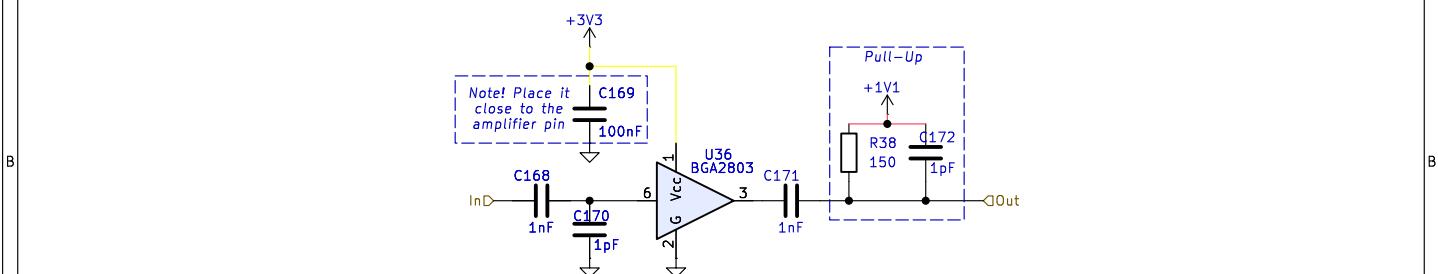
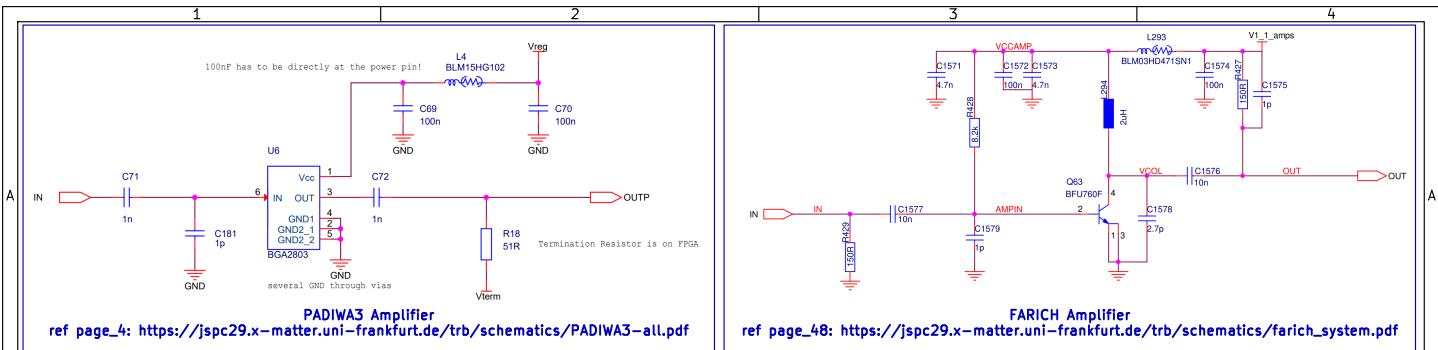
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Project: HYDRA TPC & Fiber Tracker Author: Dr. Alexandru Enciu Institution: Technische Universität Darmstadt Sheet: /amp_32/ File: BGA2803_amplifier.kicad_sch		<b>TECHNISCHE UNIVERSITÄT DARMSTADT</b>	
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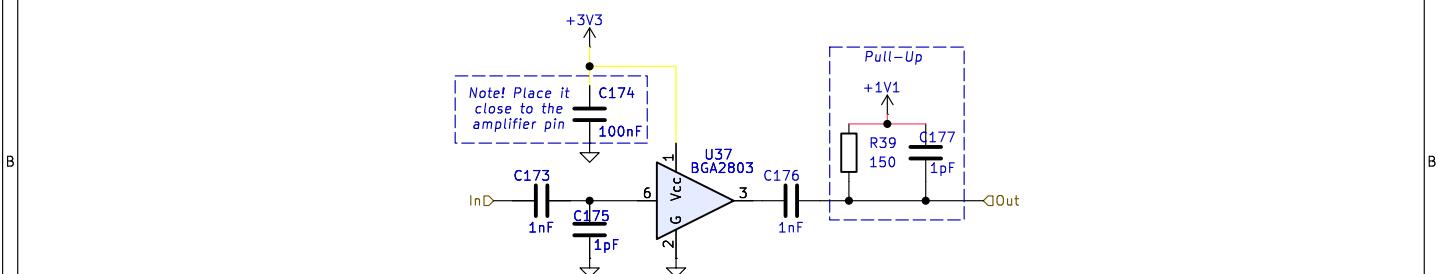
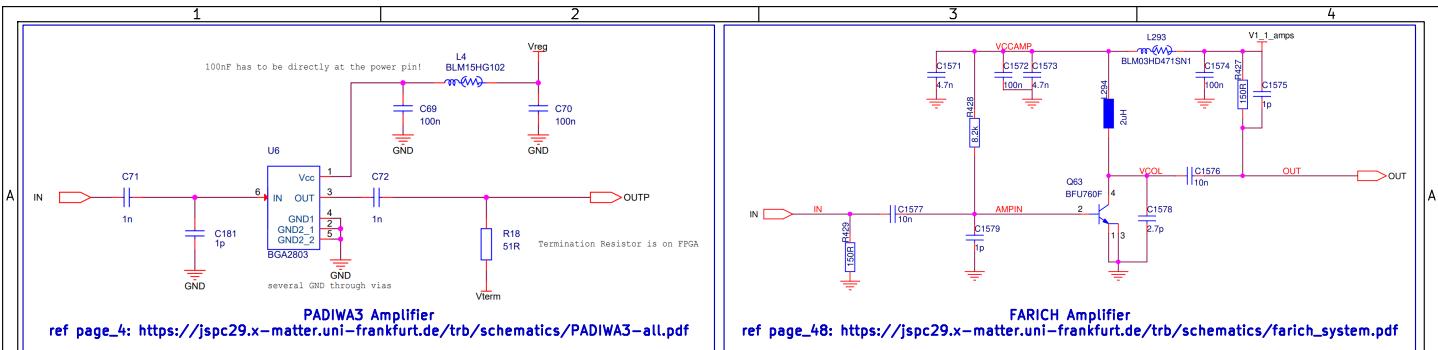
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<p>Project: HYDRA TPC &amp; Fiber Tracker          Author: Dr. Alexandru Enciu          Institution: Technische Universität Darmstadt</p>		<p>TECHNISCHE UNIVERSITÄT DARMSTADT</p>	
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<p>Project: HYDRA TPC &amp; Fiber Tracker          Author: Dr. Alexandru Enciu          Institution: Technische Universität Darmstadt          Sheet: /amp_34/          File: BGA2803_amplifier.kicad_sch</p>		<p>TECHNISCHE UNIVERSITÄT DARMSTADT</p>	
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Project: HYDRA TPC & Fiber Tracker  
 Author: Dr. Alexandru Enciu  
 Institution: Technische Universität Darmstadt

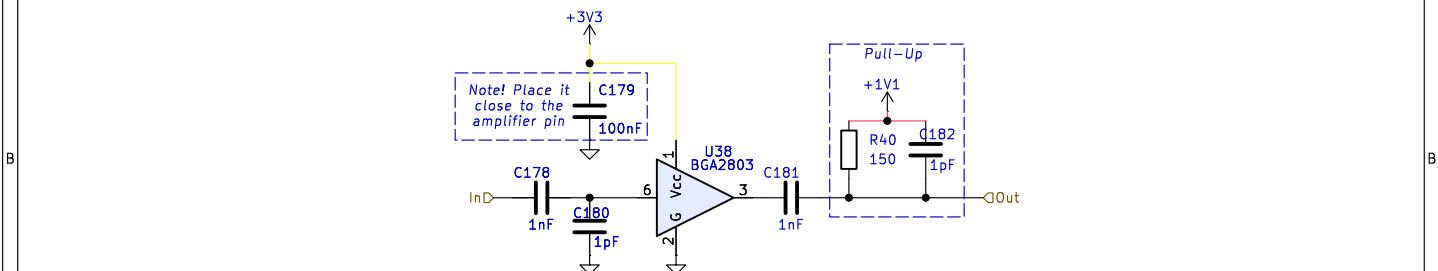
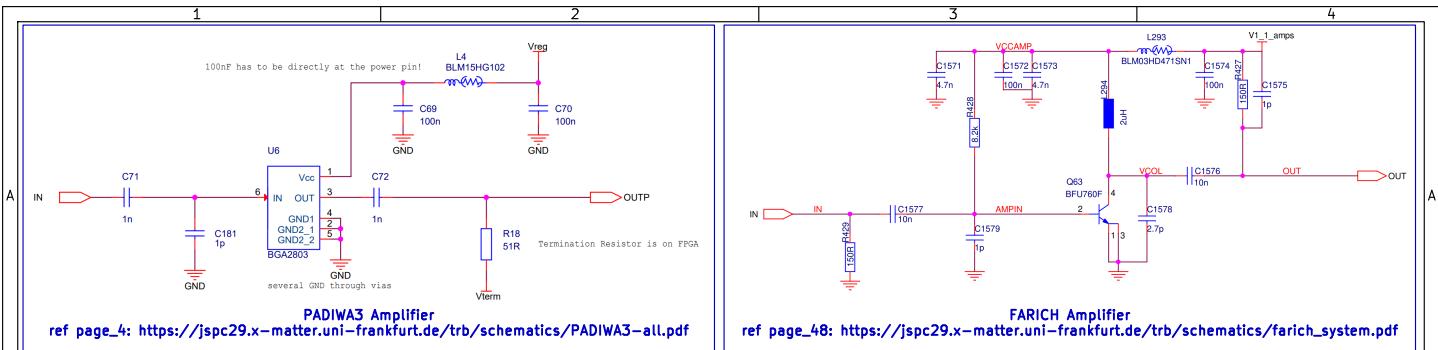


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### Title: Hamamatsu S13552 64 Channels Amplifier

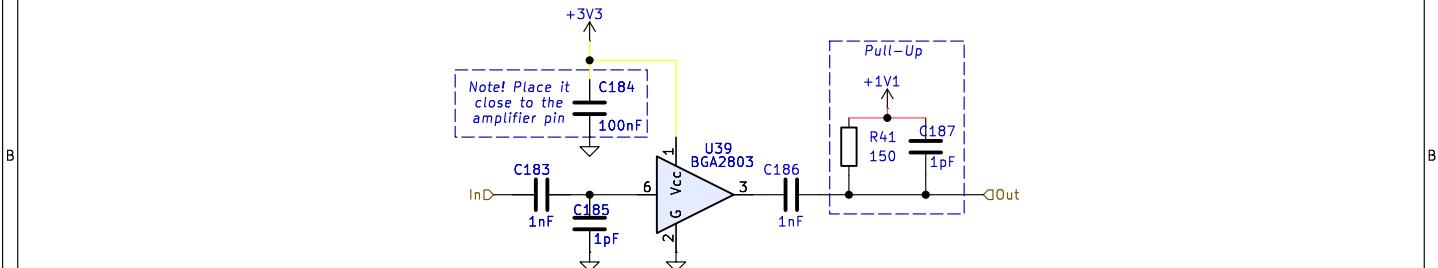
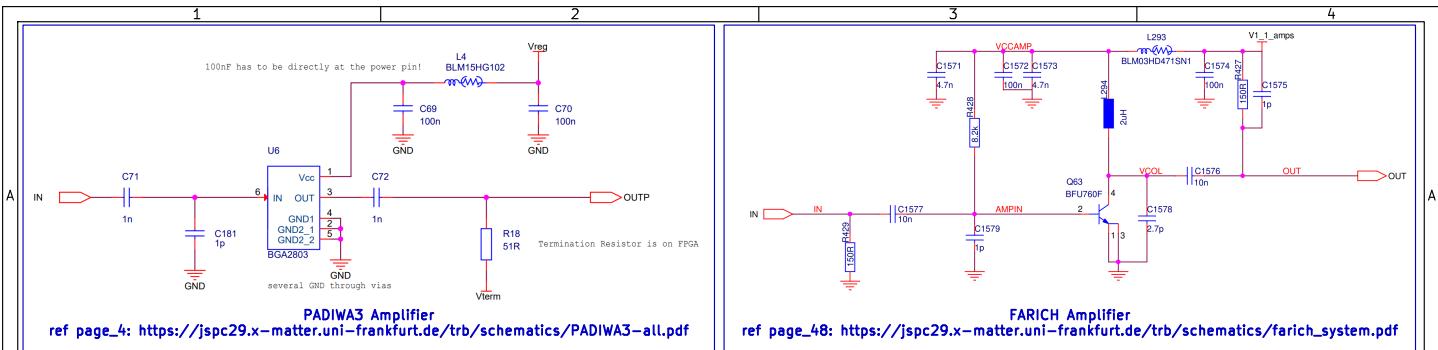
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Rev: 0  
 Id: 36/66



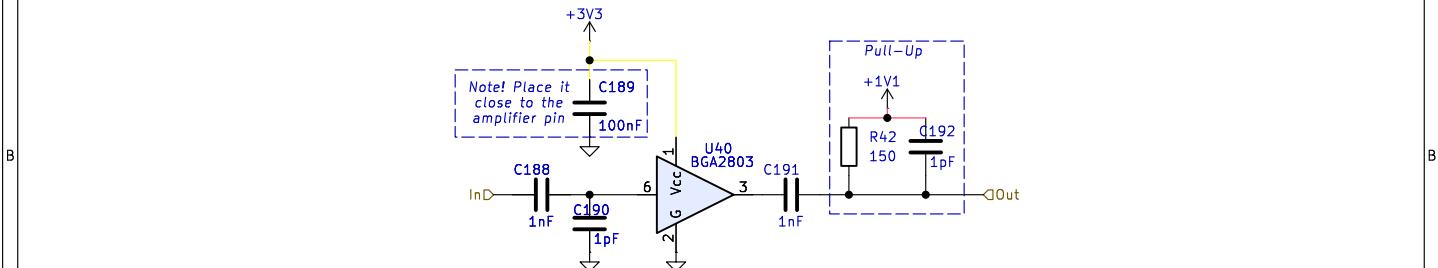
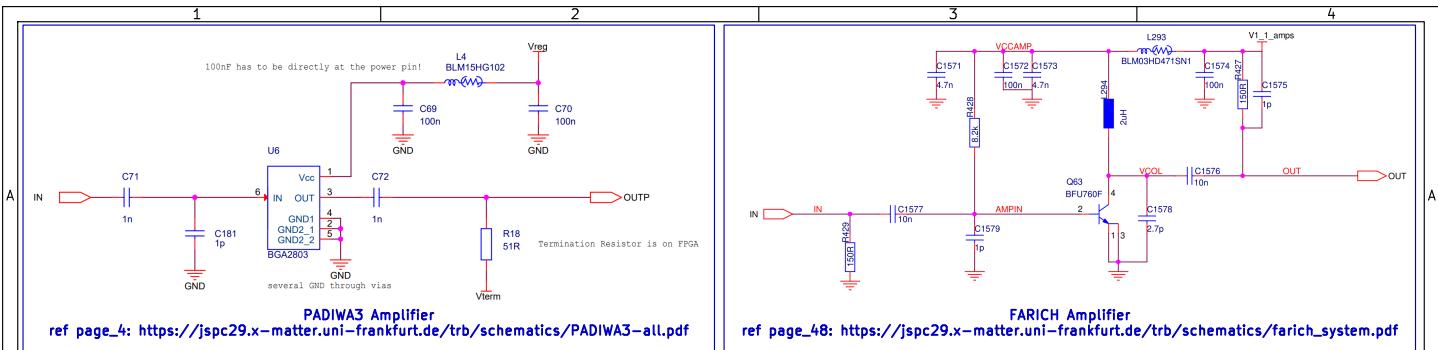
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 2. Joshua W Cates et al 2018 Phys. Med. Biol. 63 185022  
 DOI 10.1088/1361-6560/aabdc  
 3. F. Simon NIM-A Volume 926, 11 May 2019, Pages 85–100  
 doi.org/10.1016/j.nima.2018.11.042

<p>Project: HYDRA TPC &amp; Fiber Tracker          Author: Dr. Alexandru Enciu          Institution: Technische Universität Darmstadt</p>			<b>TECHNISCHE UNIVERSITÄT DARMSTADT</b>
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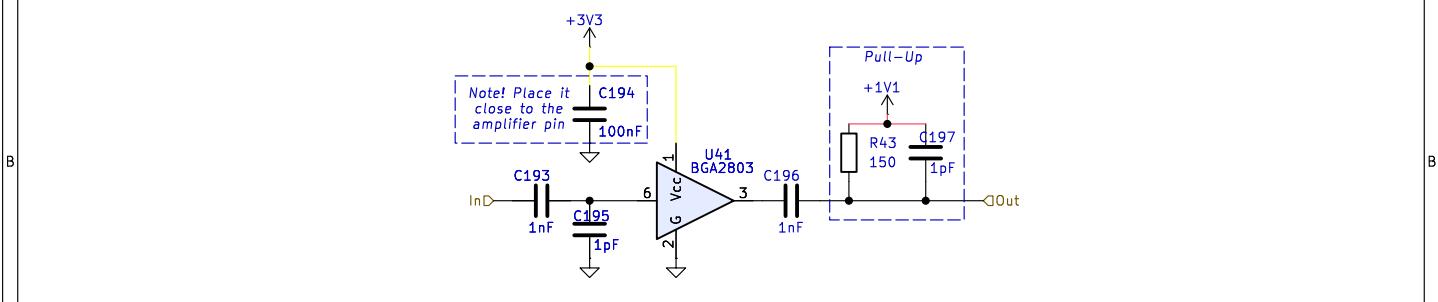
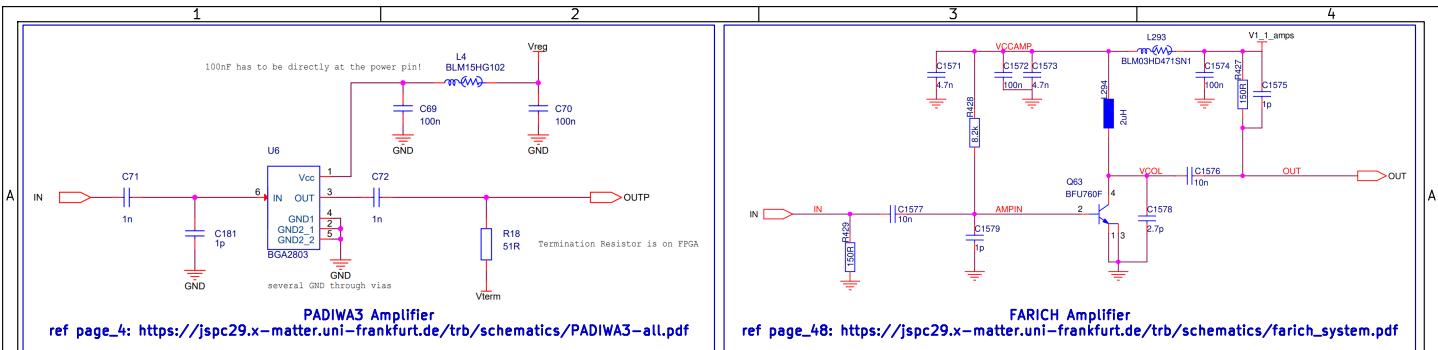
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<p>Project: HYDRA TPC &amp; Fiber Tracker          Author: Dr. Alexandru Enciu          Institution: Technische Universität Darmstadt          Sheet: /amp_37/          File: BGA2803_amplifier.kicad_sch</p>		<p>TECHNISCHE UNIVERSITÄT DARMSTADT</p>	
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<p>Project: HYDRA TPC &amp; Fiber Tracker          Author: Dr. Alexandru Enciu          Institution: Technische Universität Darmstadt</p>			<b>TECHNISCHE UNIVERSITÄT DARMSTADT</b>
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Project: HYDRA TPC & Fiber Tracker  
 Author: Dr. Alexandru Enciu  
 Institution: Technische Universität Darmstadt

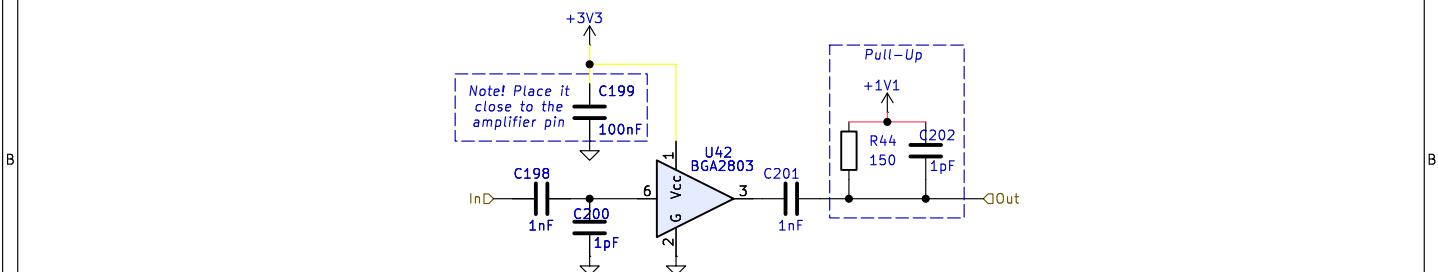
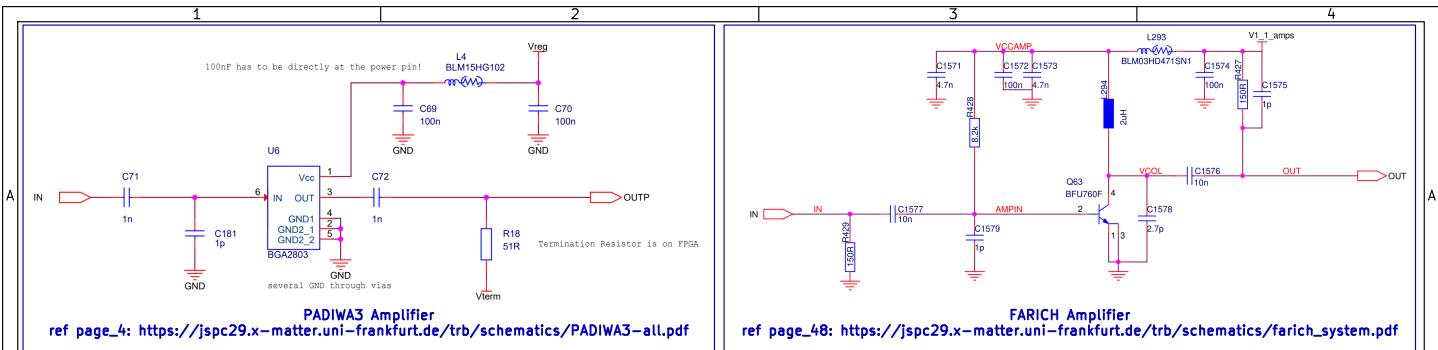


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### Title: Hamamatsu S13552 64 Channels Amplifier

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Rev: 0  
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Other ref:  
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Project: HYDRA TPC & Fiber Tracker  
 Author: Dr. Alexandru Enciu  
 Institution: Technische Universität Darmstadt

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### Title: Hamamatsu S13552 64 Channels Amplifier

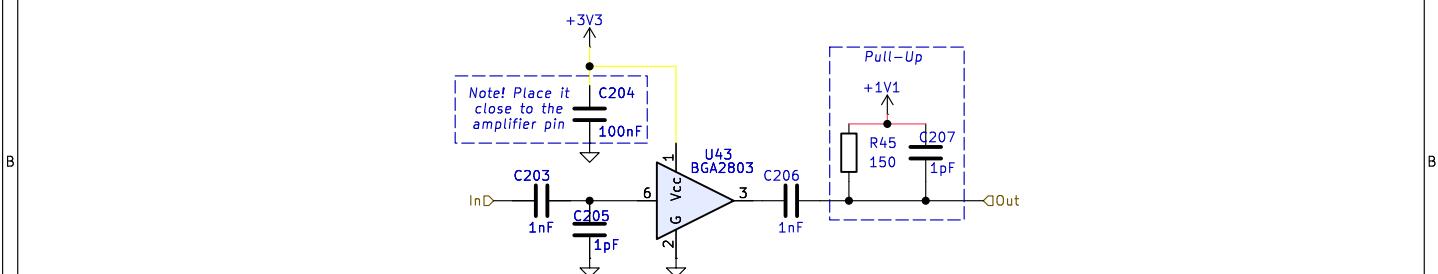
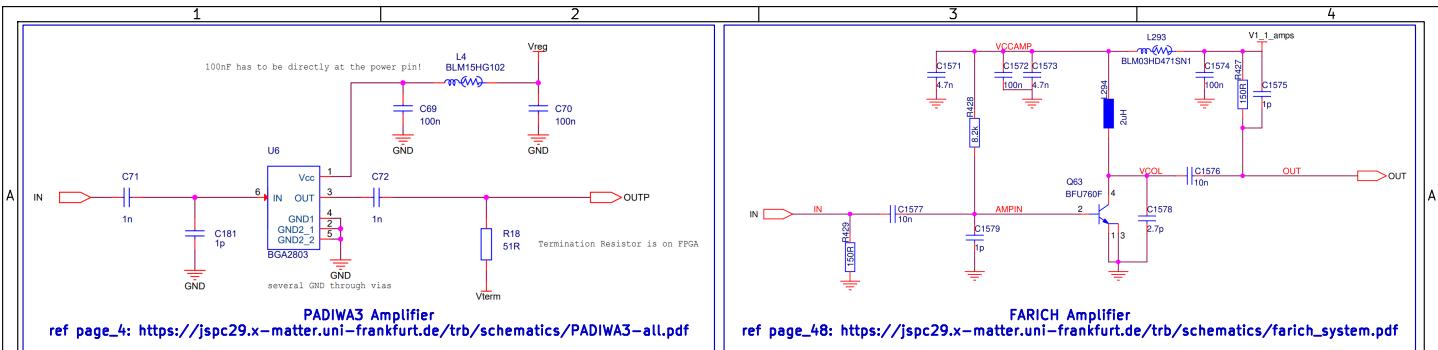
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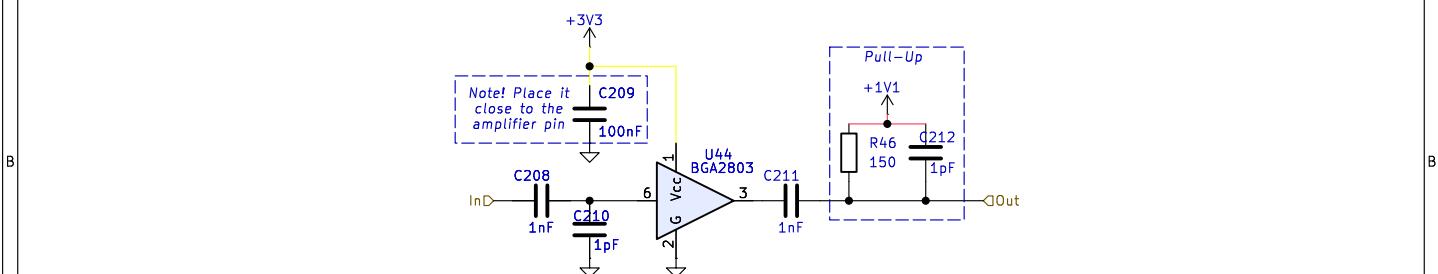
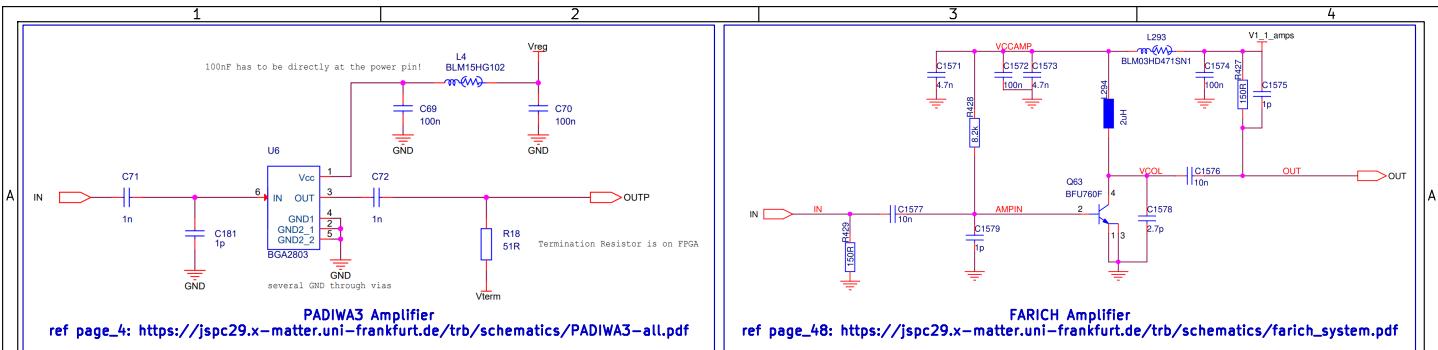
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<p>Project: HYDRA TPC &amp; Fiber Tracker          Author: Dr. Alexandru Enciu          Institution: Technische Universität Darmstadt          Sheet: /amp_41/          File: BGA2803_amplifier.kicad_sch</p>		<p>TECHNISCHE UNIVERSITÄT DARMSTADT</p>	
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 2. Joshua W Cates et al 2018 Phys. Med. Biol. 63 185022  
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Project: HYDRA TPC & Fiber Tracker  
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 Institution: Technische Universität Darmstadt

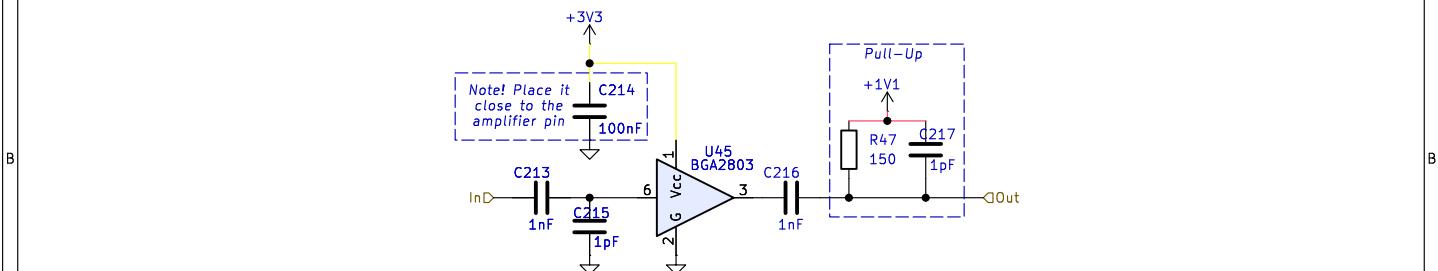
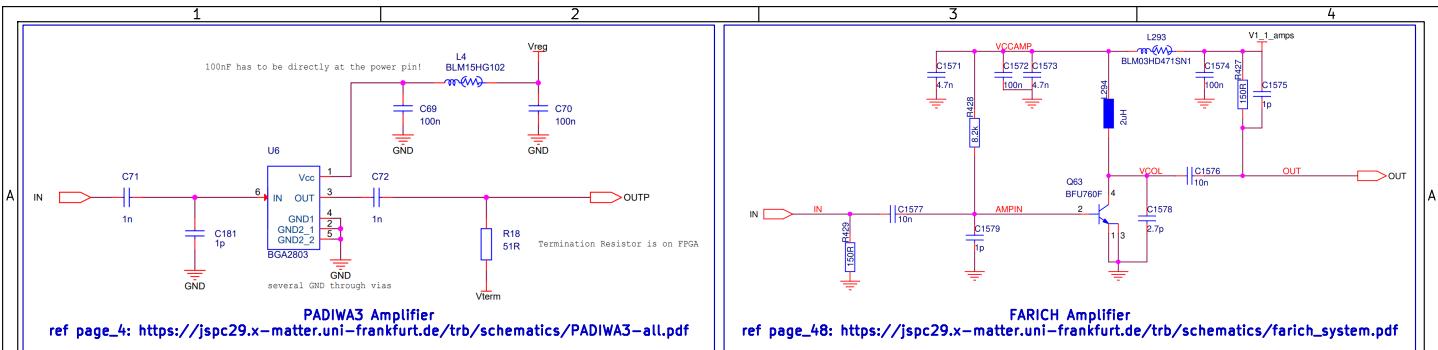
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Project: HYDRA TPC & Fiber Tracker  
 Author: Dr. Alexandru Enciu  
 Institution: Technische Universität Darmstadt

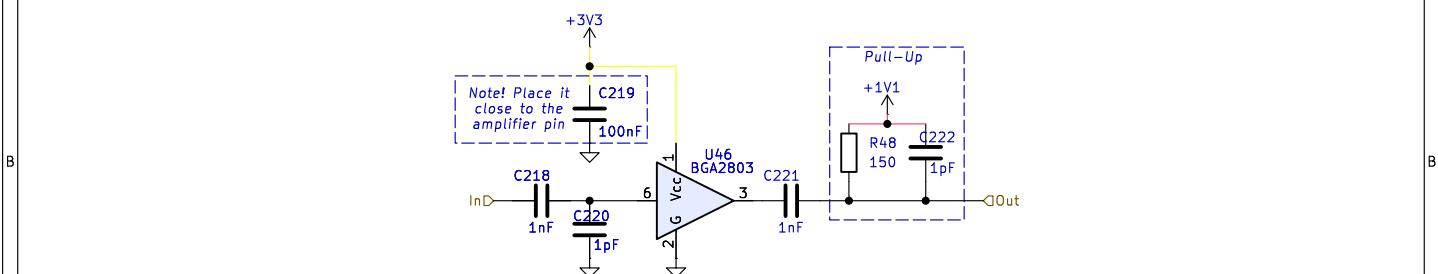
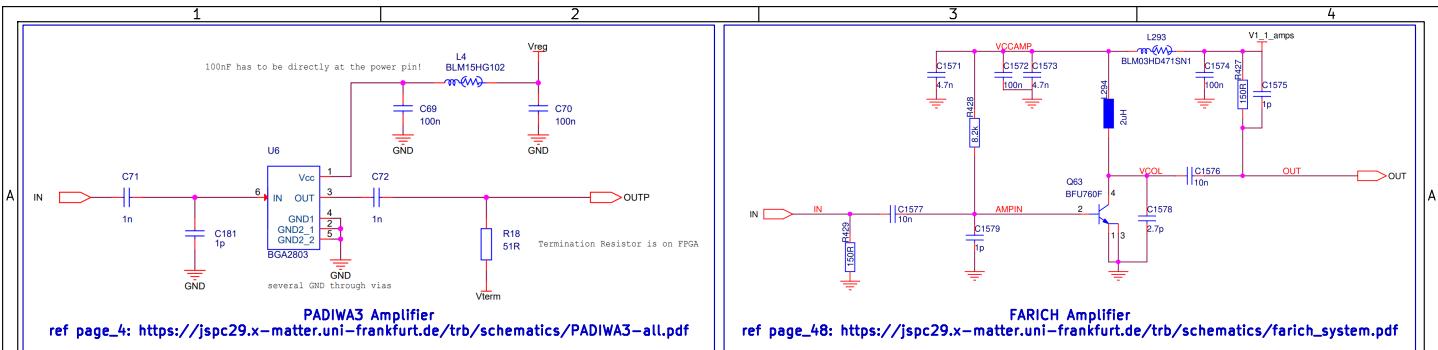


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### Title: Hamamatsu S13552 64 Channels Amplifier

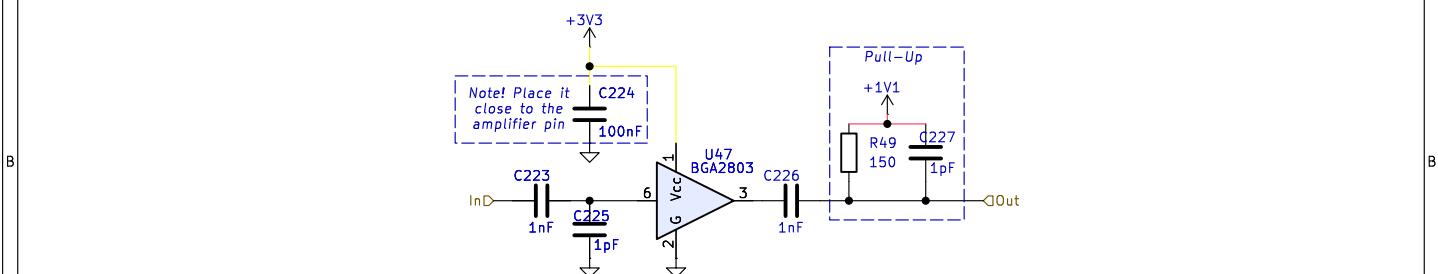
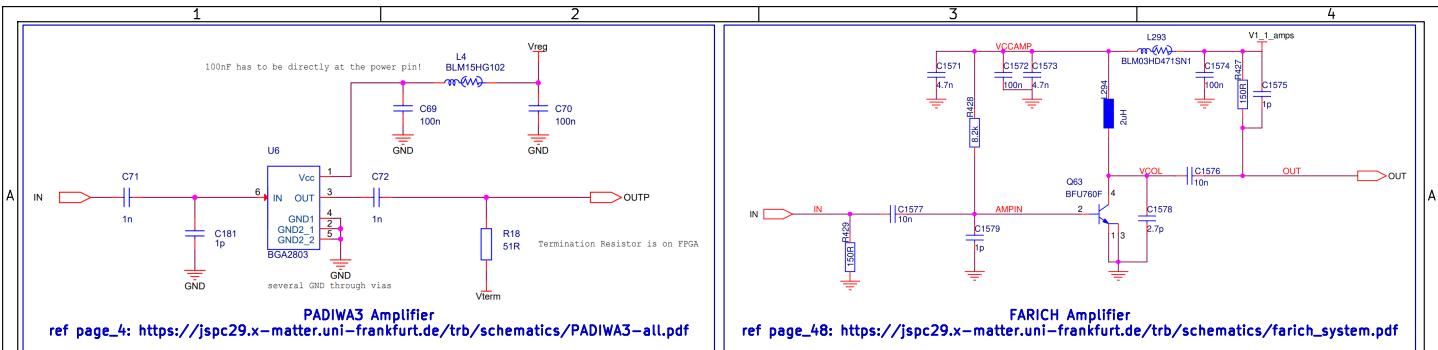
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Rev: 0  
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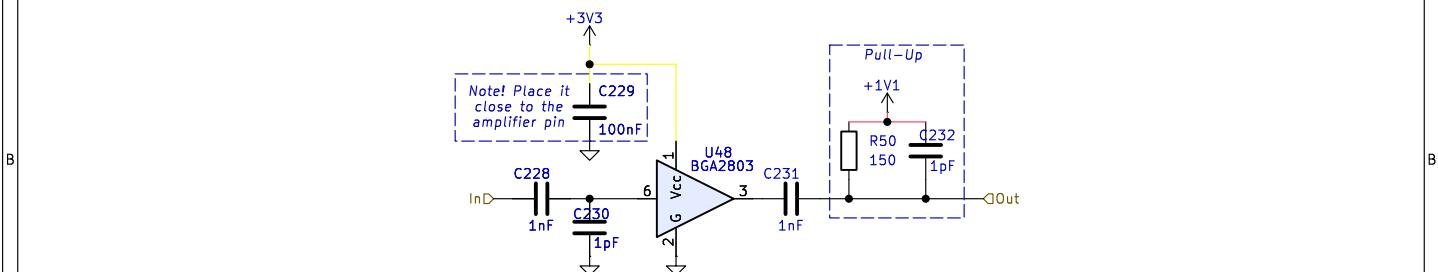
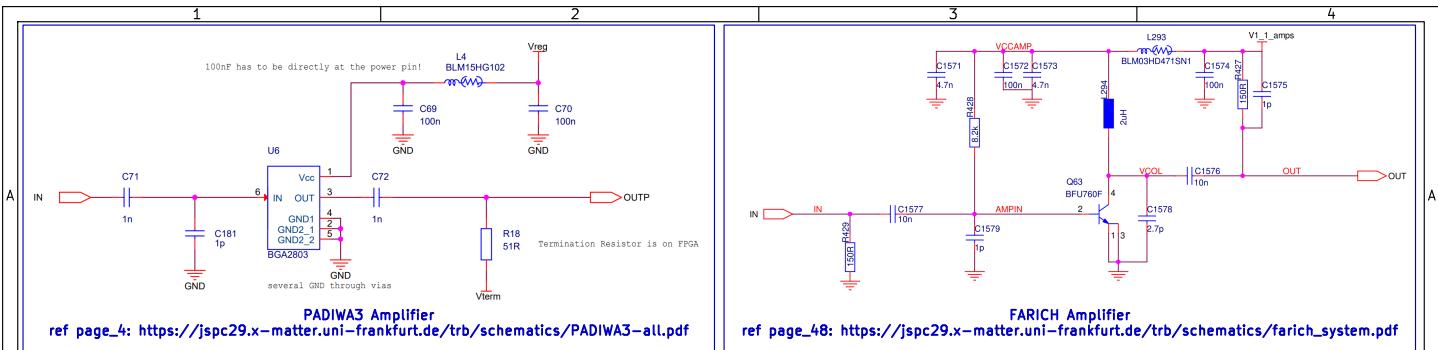
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<p>Project: HYDRA TPC &amp; Fiber Tracker          Author: Dr. Alexandru Enciu          Institution: Technische Universität Darmstadt          Sheet: /amp_44/          File: BGA2803_amplifier.kicad_sch</p>		<p>TECHNISCHE UNIVERSITÄT DARMSTADT</p>	
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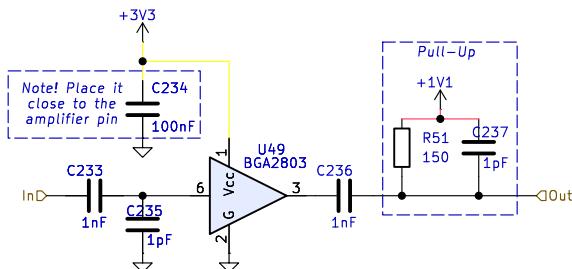
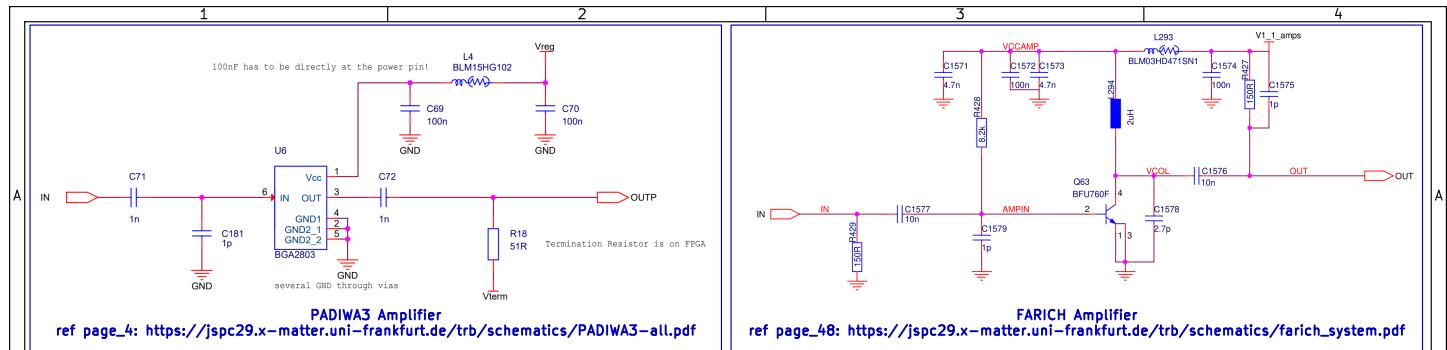
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<p>Project: HYDRA TPC &amp; Fiber Tracker          Author: Dr. Alexandru Enciu          Institution: Technische Universität Darmstadt</p>			<b>TECHNISCHE UNIVERSITÄT DARMSTADT</b>
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 3. F. Simon NIM-A Volume 926, 11 May 2019, Pages 85–100  
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<p>Project: HYDRA TPC &amp; Fiber Tracker          Author: Dr. Alexandru Enciu          Institution: Technische Universität Darmstadt</p>			<b>TECHNISCHE UNIVERSITÄT DARMSTADT</b>
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DOI 10.1088/1361-6560/aabdc  
3. F. Simon NIM-A Volume 926, 11 May 2019, Pages 85–100  
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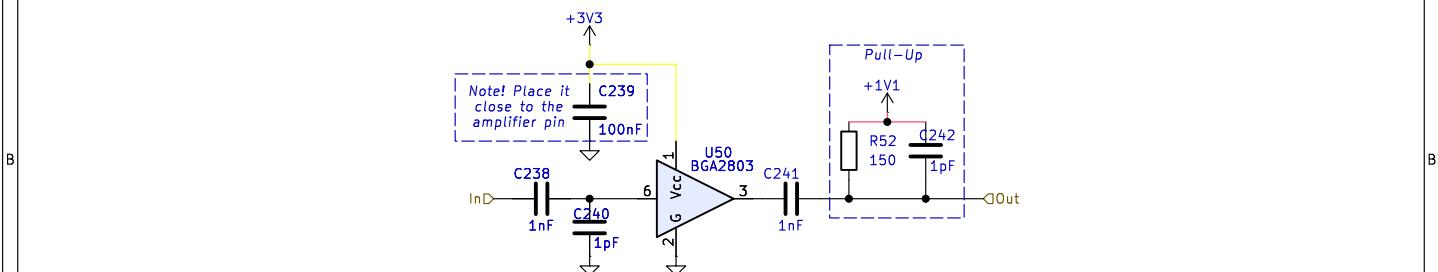
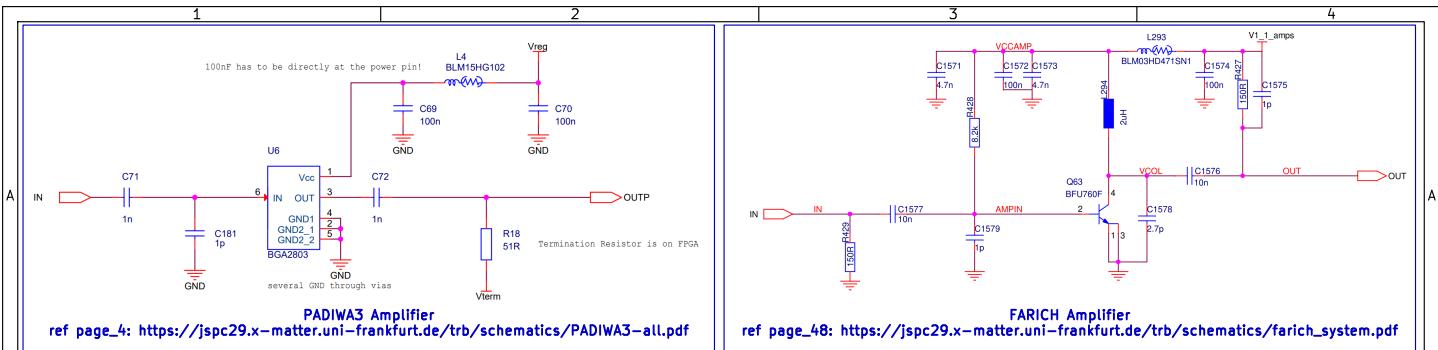
Project: HYDRA TPC & Fiber Tracker  
Author: Dr. Alexandru Enciu  
**Institution:** Technische Universität Darmstadt



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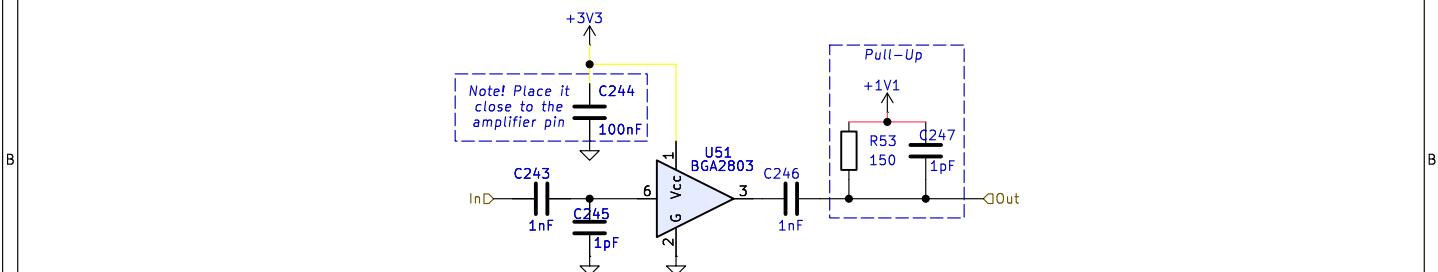
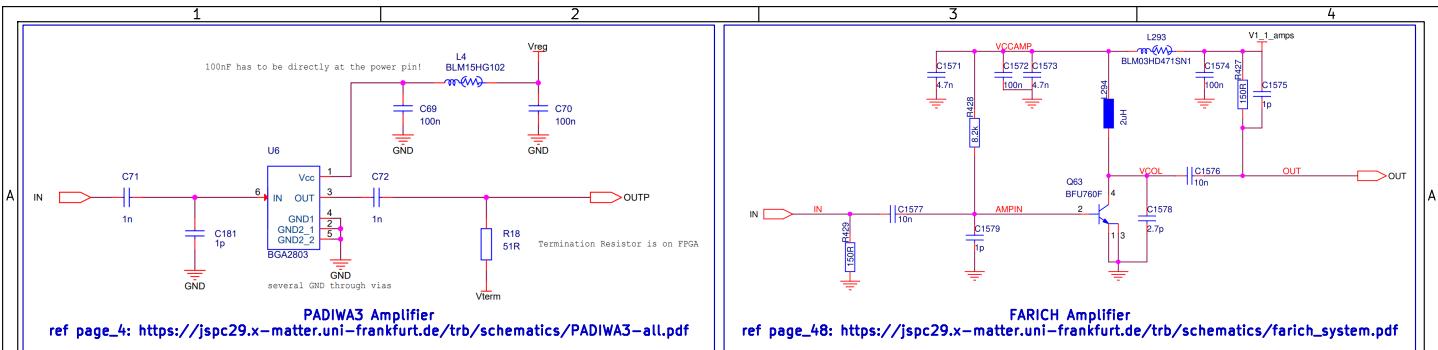
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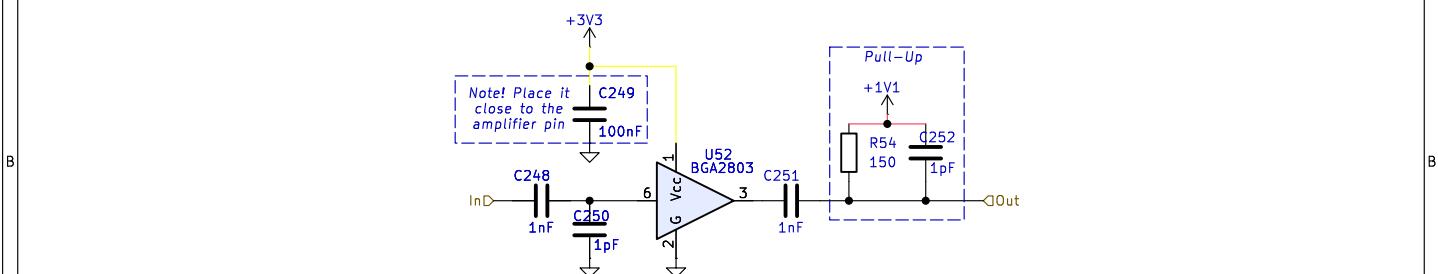
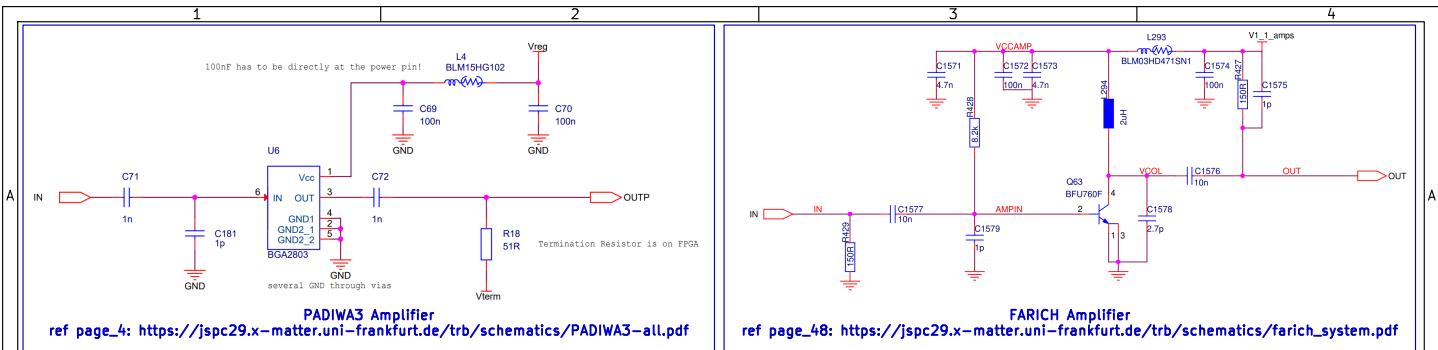
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<p>Project: HYDRA TPC &amp; Fiber Tracker          Author: Dr. Alexandru Enciu          Institution: Technische Universität Darmstadt          Sheet: /amp_48/          File: BGA2803_amplifier.kicad_sch</p>		<p>TECHNISCHE UNIVERSITÄT DARMSTADT</p>	
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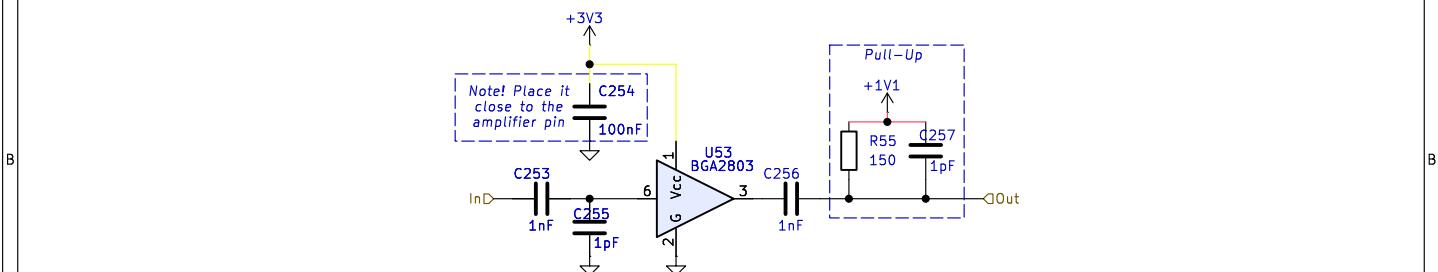
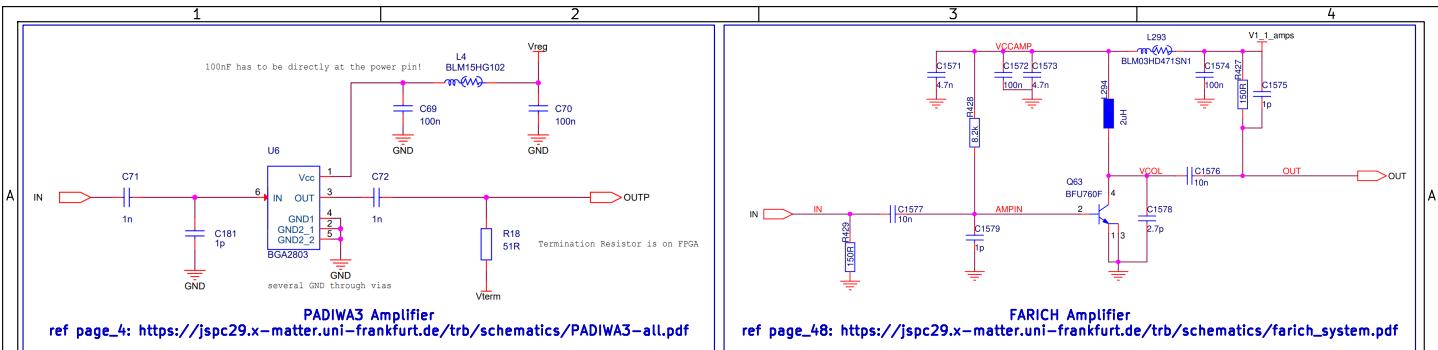
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<p>Project: HYDRA TPC &amp; Fiber Tracker          Author: Dr. Alexandru Enciu          Institution: Technische Universität Darmstadt          Sheet: /amp_49/          File: BGA2803_amplifier.kicad_sch</p>		<p>TECHNISCHE UNIVERSITÄT DARMSTADT</p>	
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<p>Project: HYDRA TPC &amp; Fiber Tracker          Author: Dr. Alexandru Enciu          Institution: Technische Universität Darmstadt</p>			<b>TECHNISCHE UNIVERSITÄT DARMSTADT</b>
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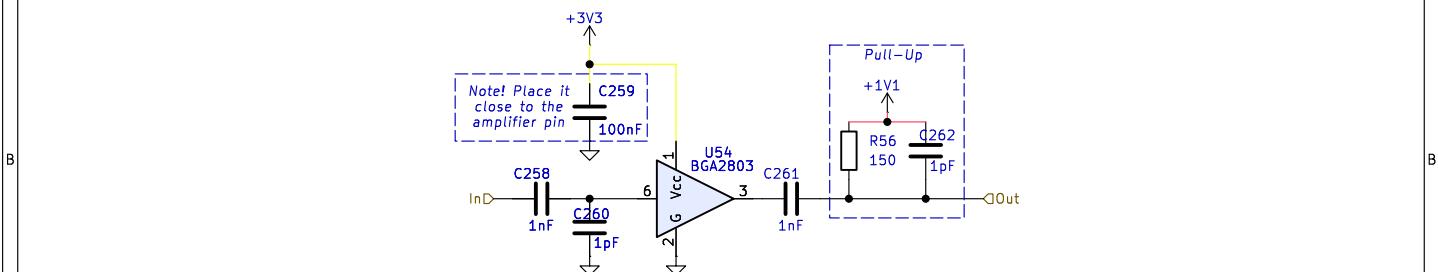
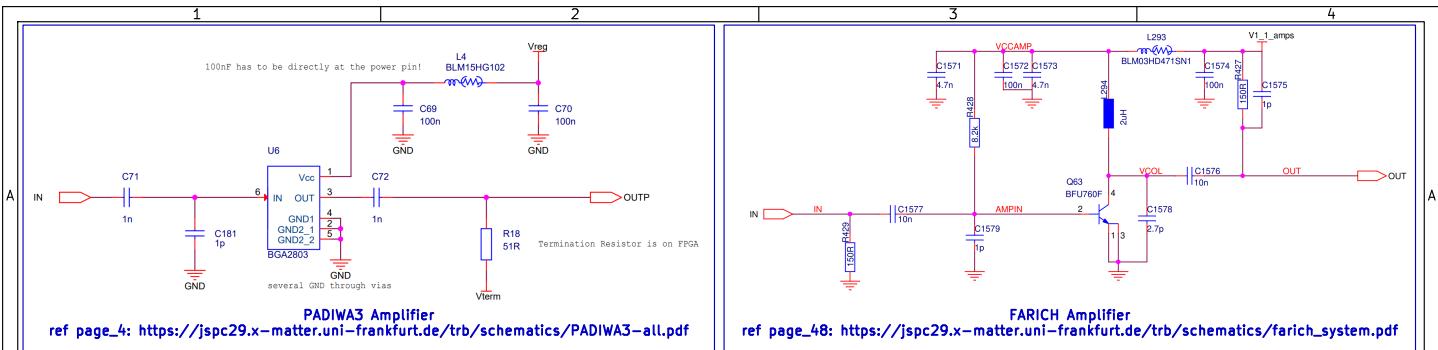
Project: HYDRA TPC & Fiber Tracker  
 Author: Dr. Alexandru Enciu  
 Institution: Technische Universität Darmstadt



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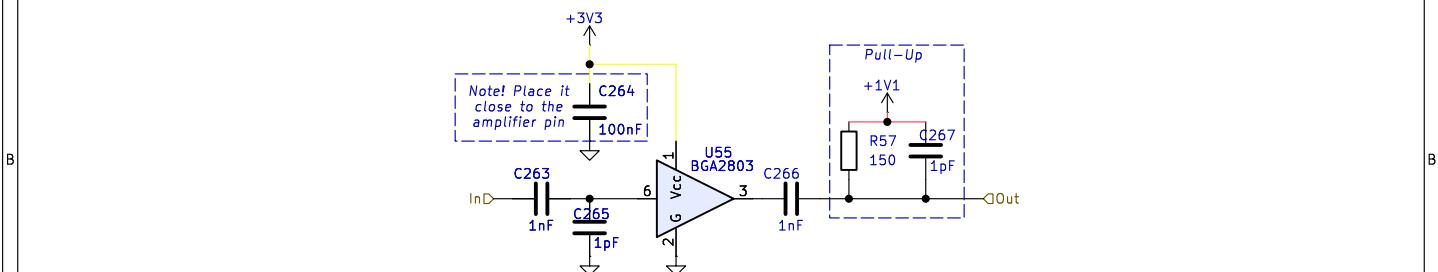
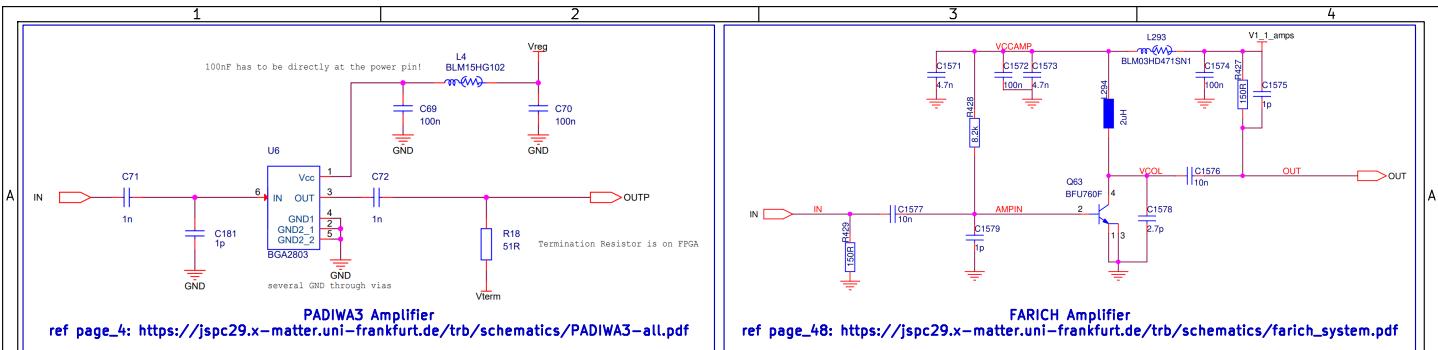
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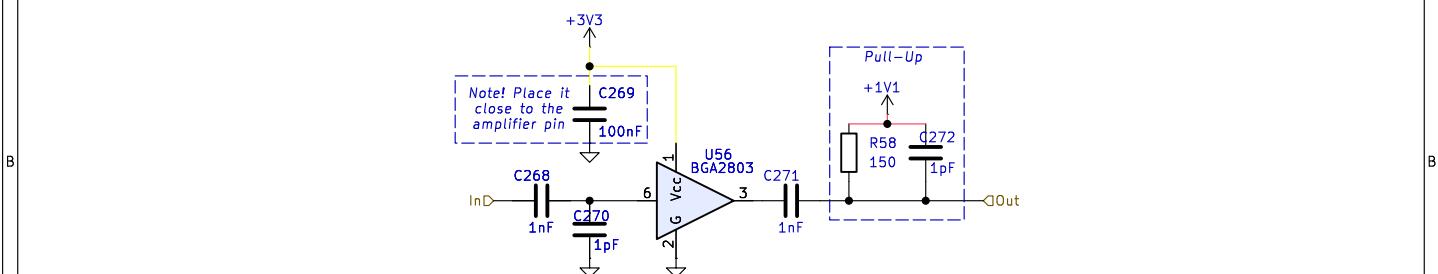
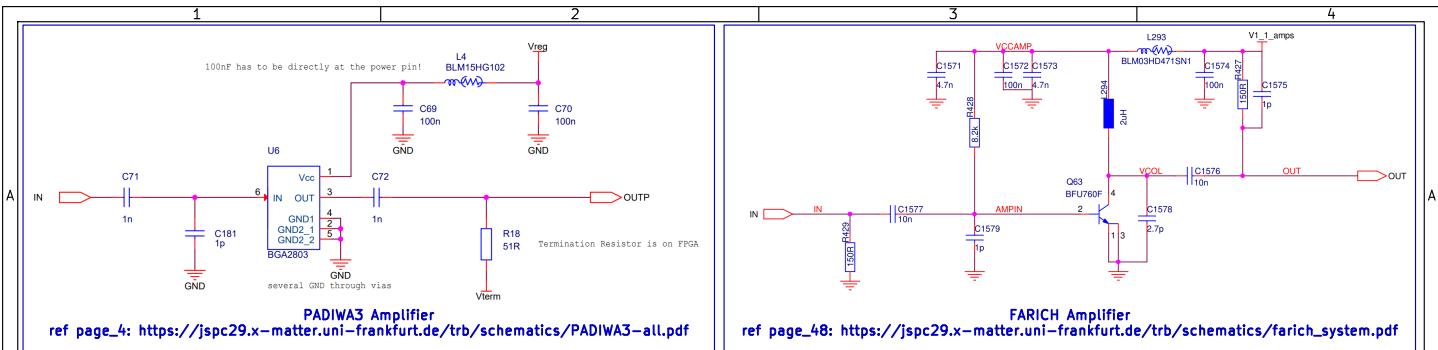
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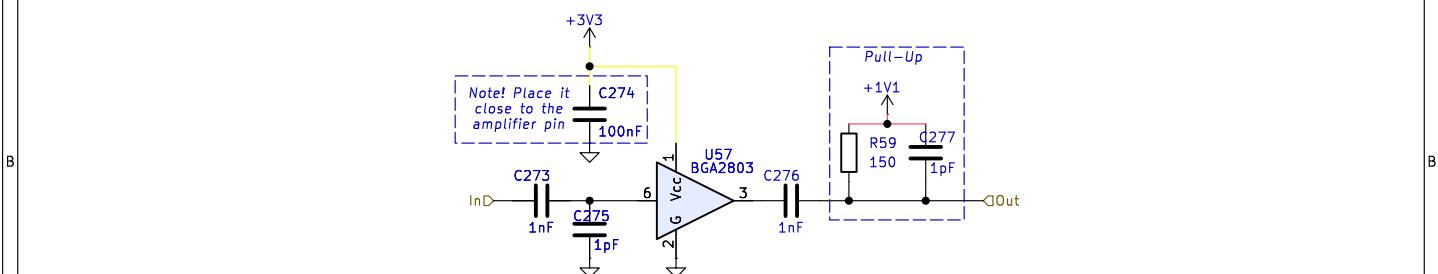
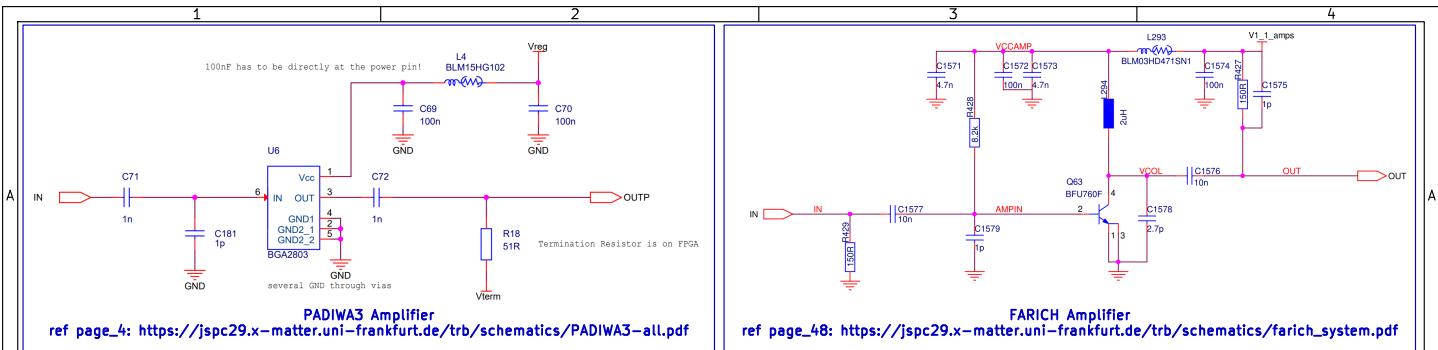
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<p>Project: HYDRA TPC &amp; Fiber Tracker          Author: Dr. Alexandru Enciu          Institution: Technische Universität Darmstadt</p>			<b>TECHNISCHE UNIVERSITÄT DARMSTADT</b>
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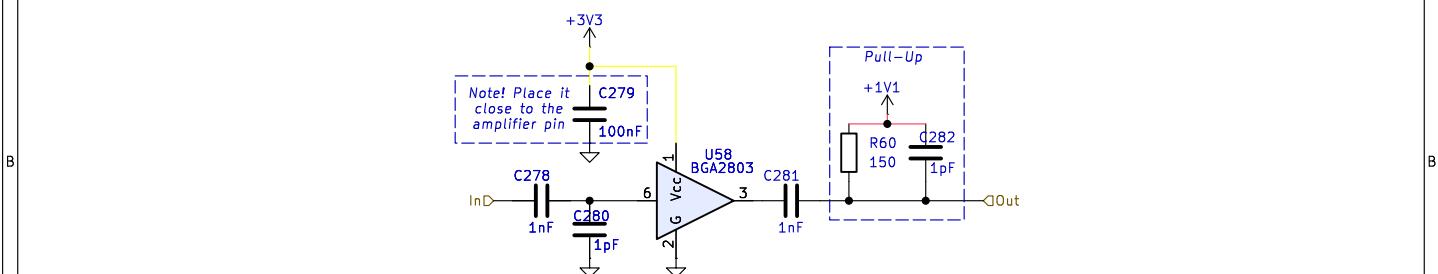
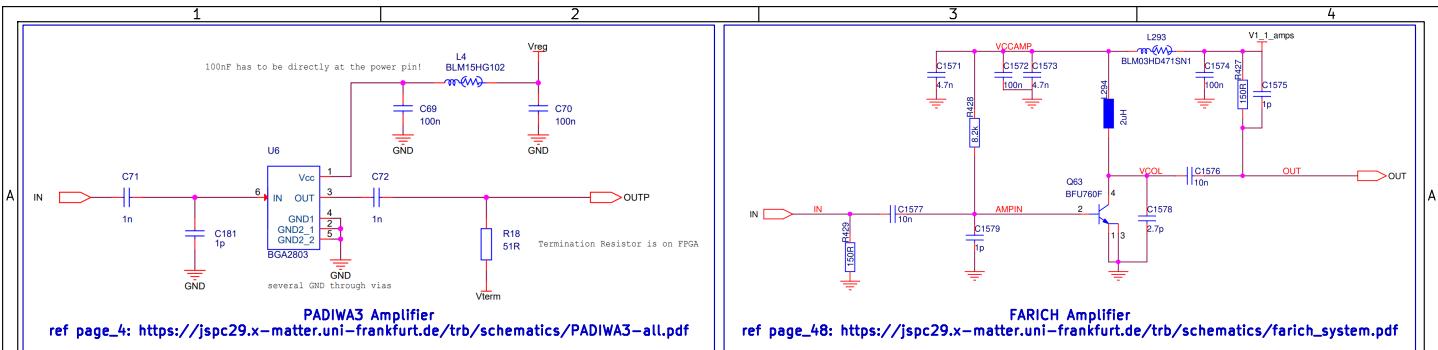
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<p>Project: HYDRA TPC &amp; Fiber Tracker          Author: Dr. Alexandru Enciu          Institution: Technische Universität Darmstadt</p>		<p>TECHNISCHE UNIVERSITÄT DARMSTADT</p>	
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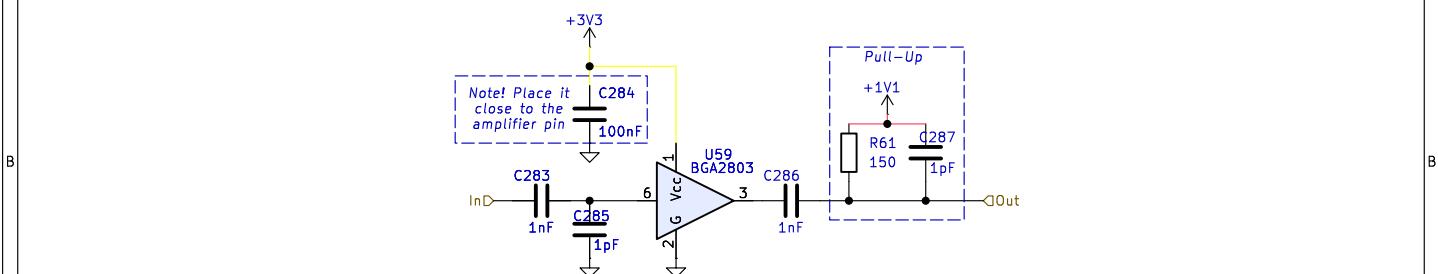
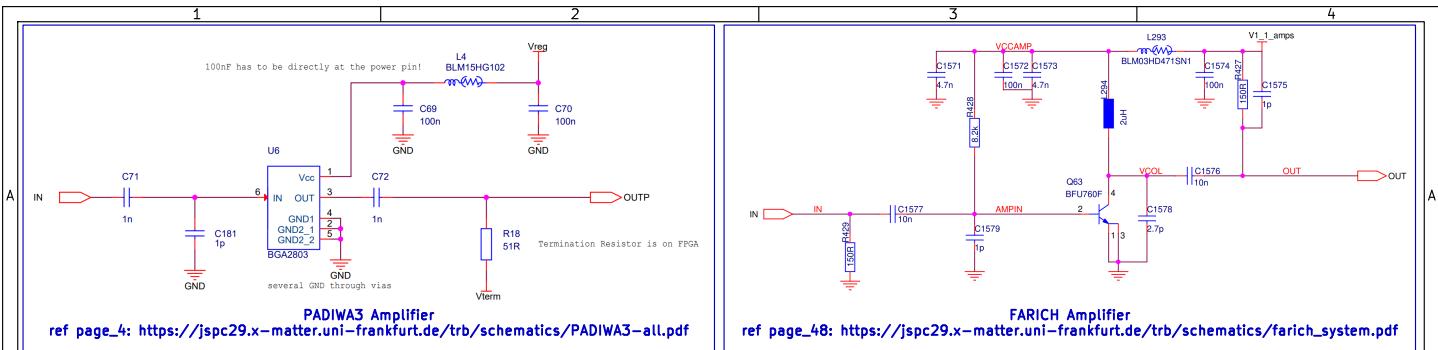
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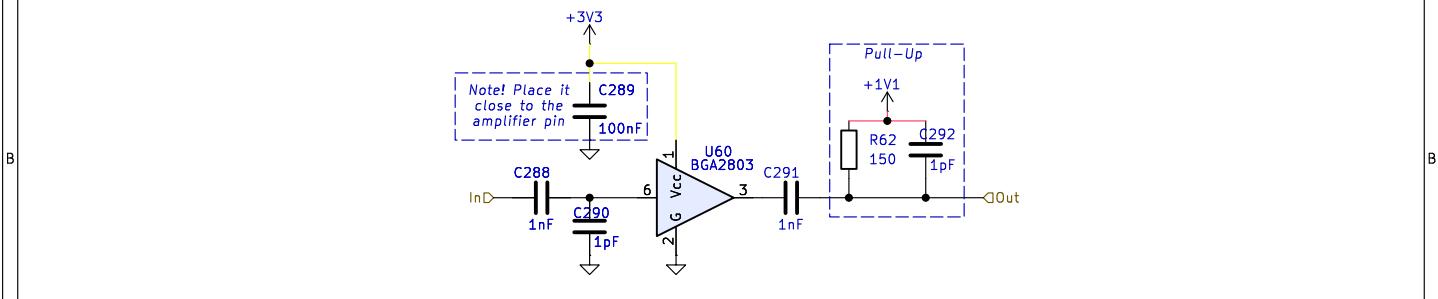
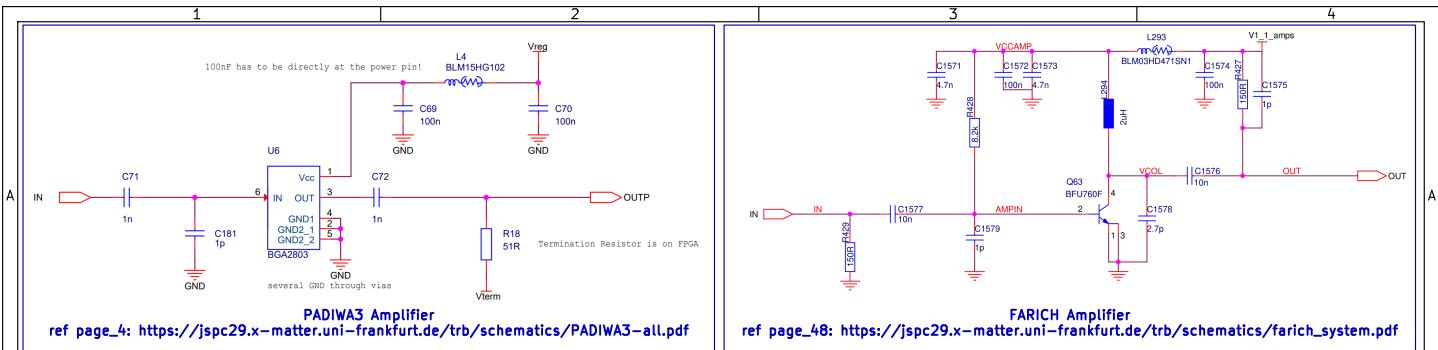
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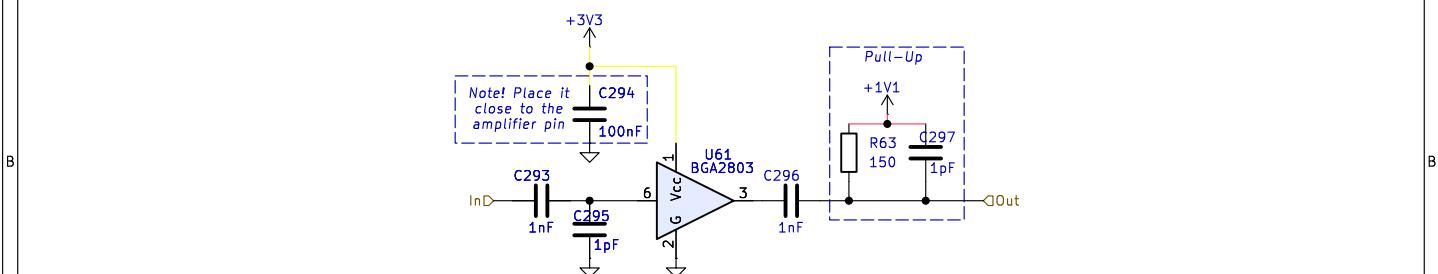
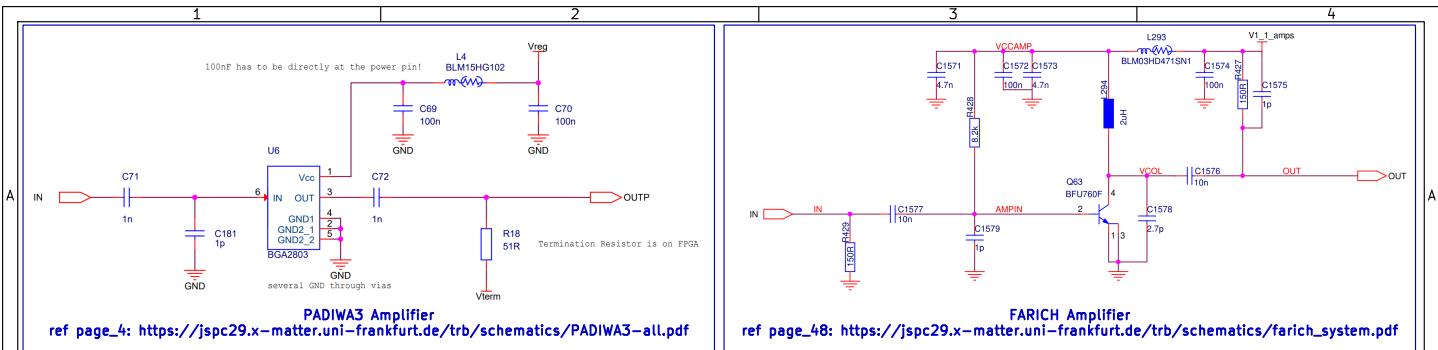
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Project: HYDRA TPC & Fiber Tracker  
 Author: Dr. Alexandru Enciu  
 Institution: Technische Universität Darmstadt

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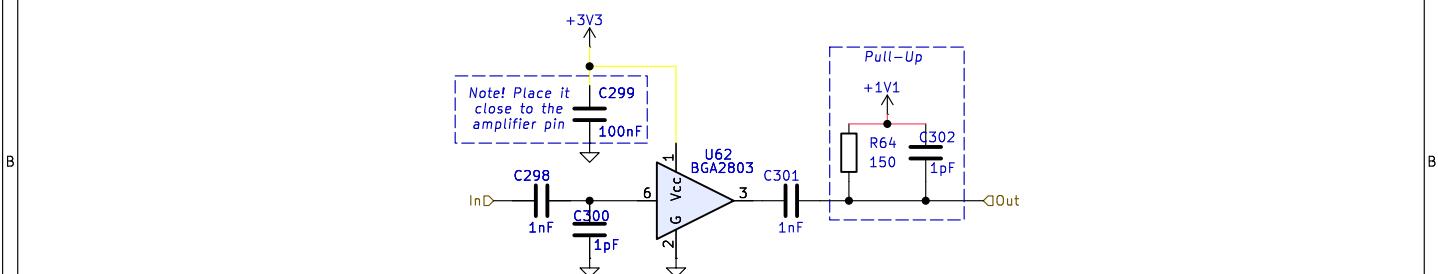
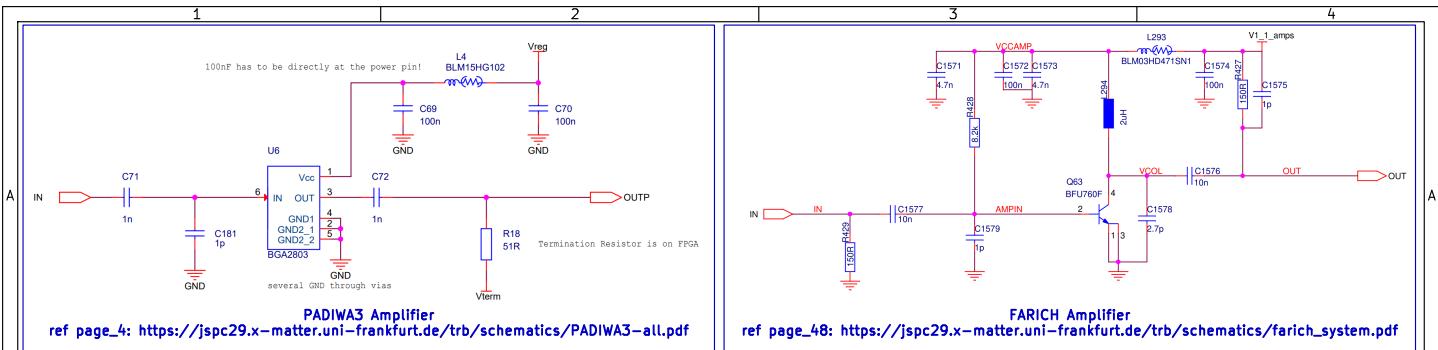
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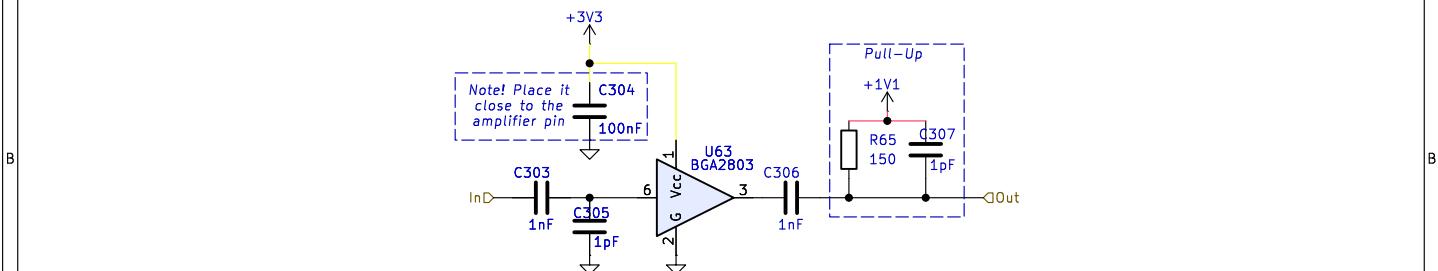
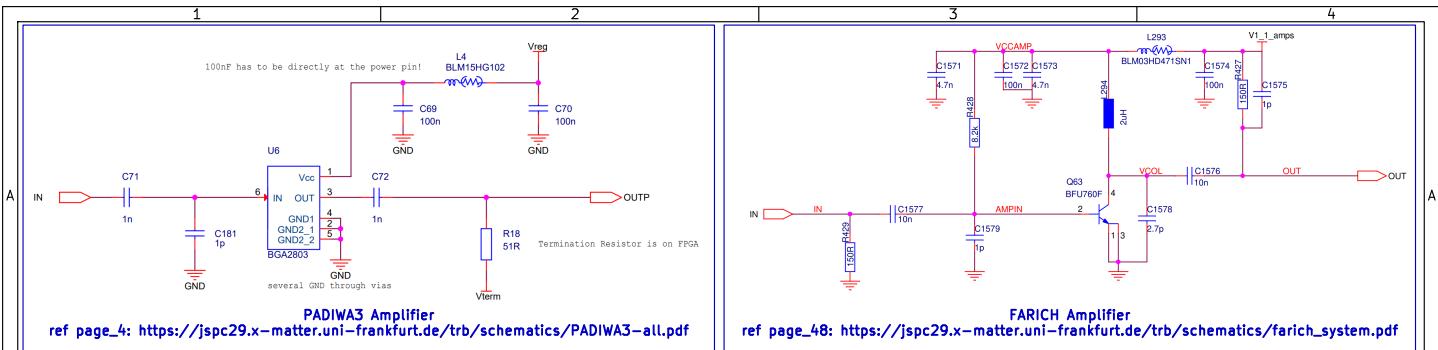
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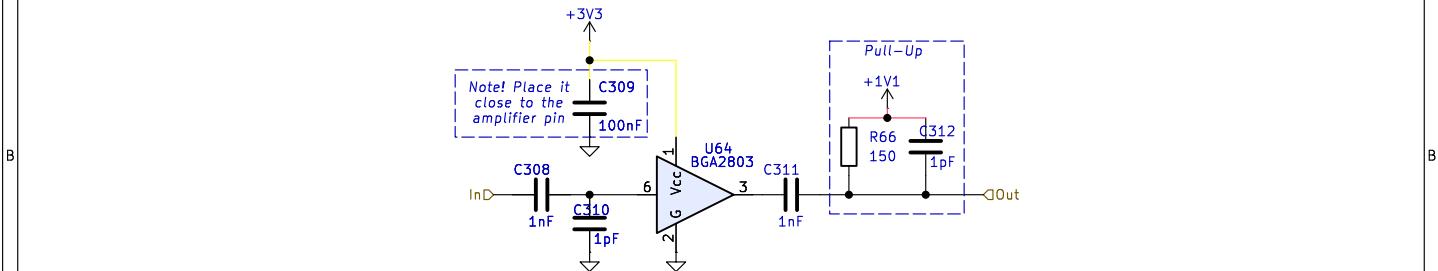
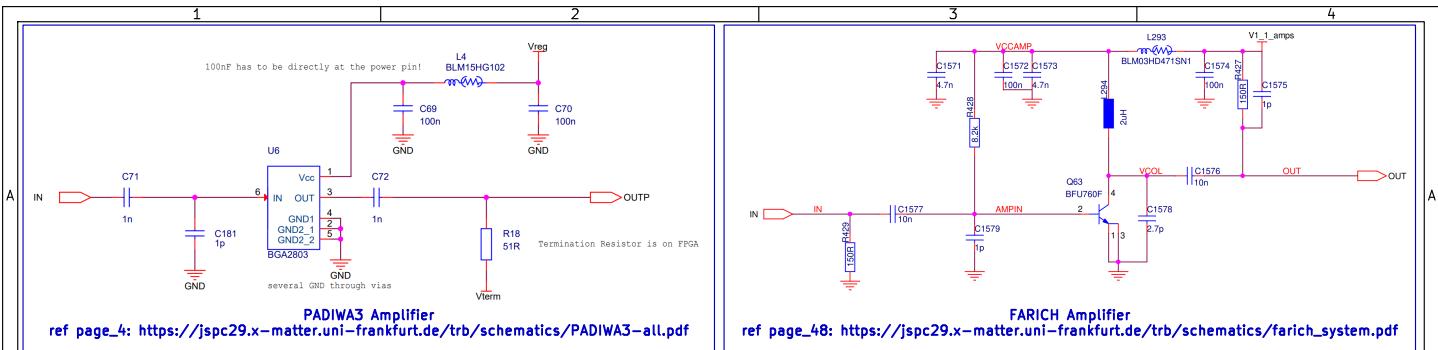
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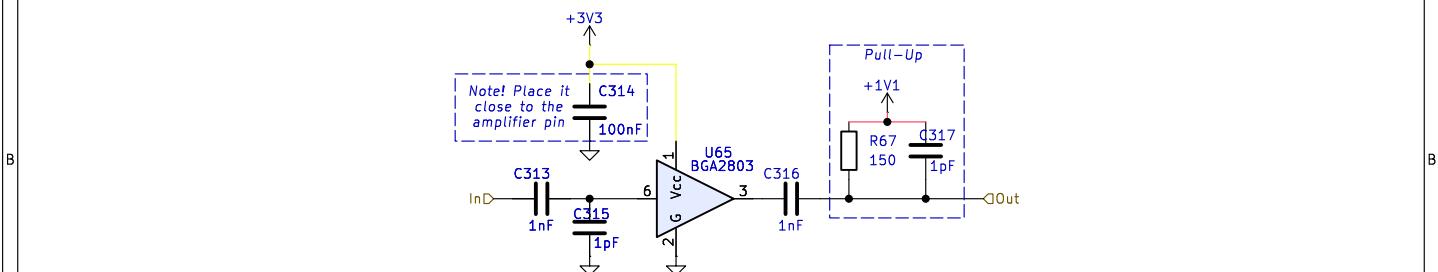
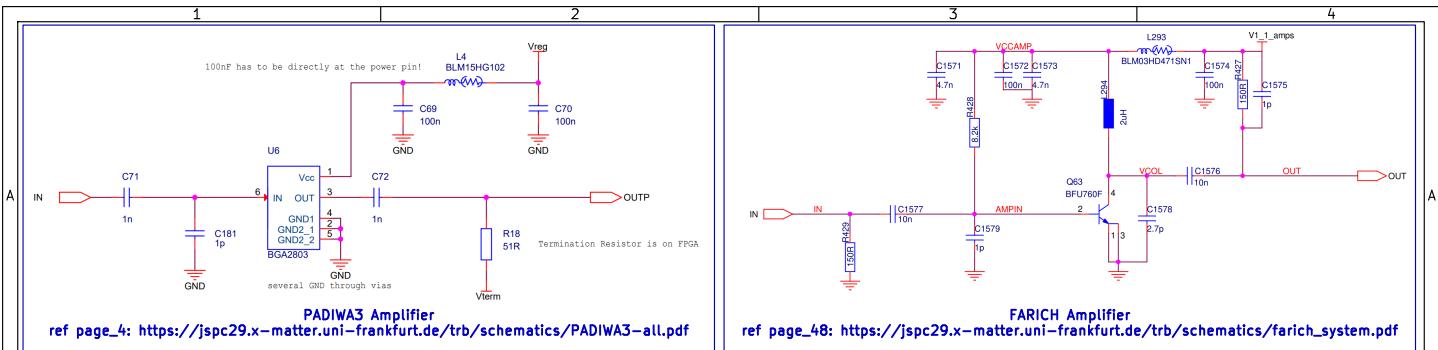


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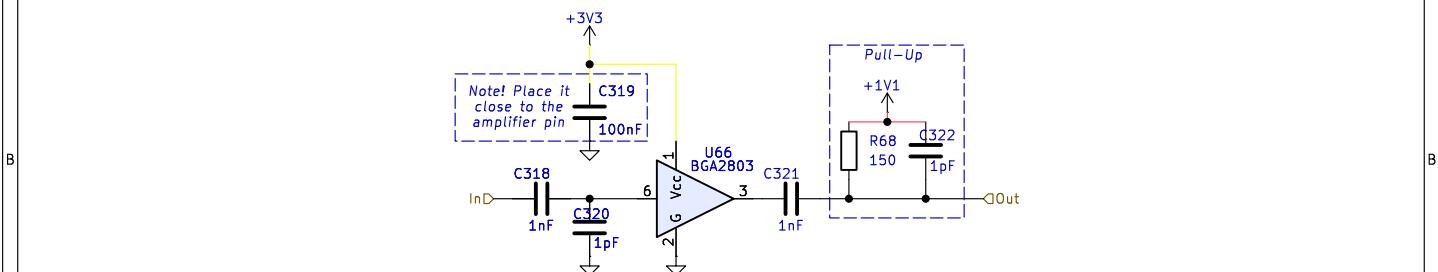
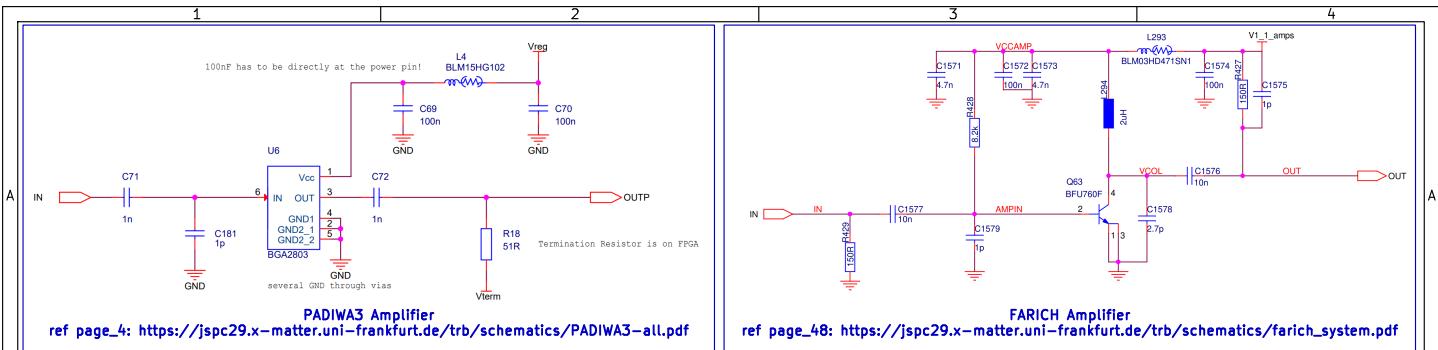
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