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**Hat Labs Oy**

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File: HALPI2.kicad\_sch

**Title: HALPI2**

Size: A4

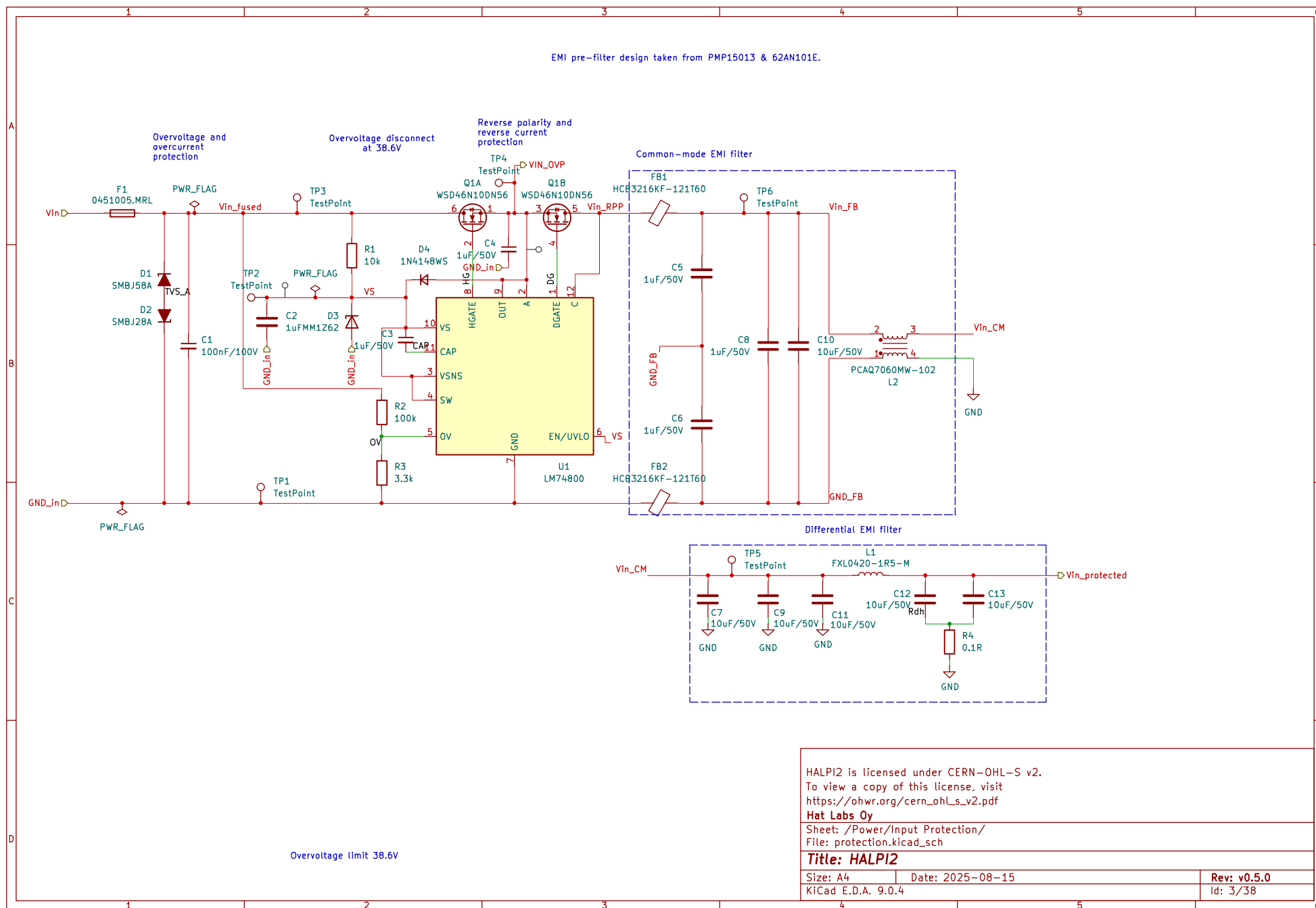
Date: 2025-08-15

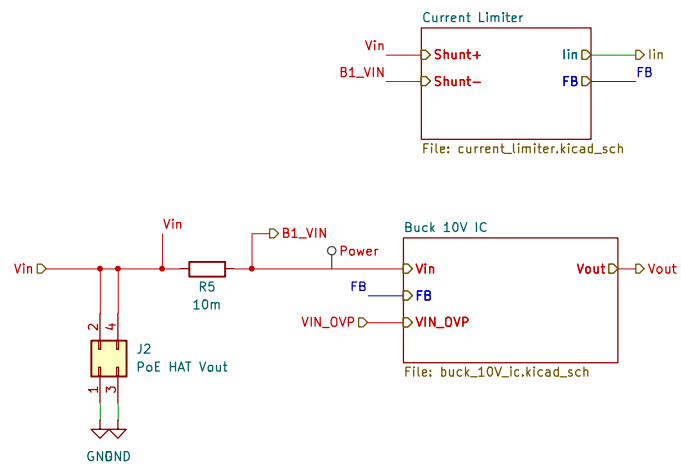
Rev: v0.5.0

KiCad E.D.A. 9.0.4

Id: 1/38







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**Hat Labs Oy**

Sheet: /Power/Buck converter 10V/  
File: buck\_10V.kicad\_sch

**Title: HALPI2**

Size: A4

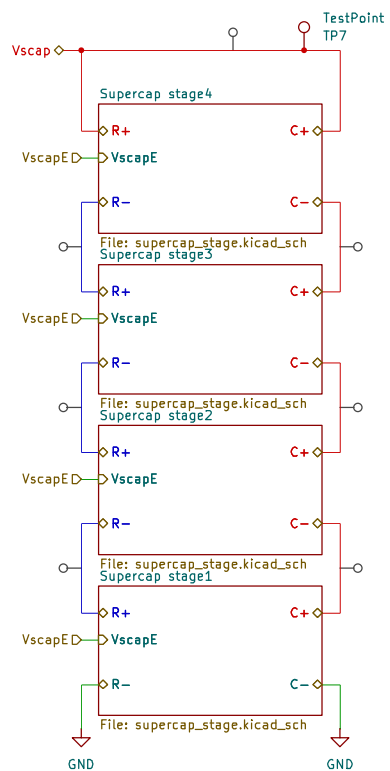
Date: 2025-08-15

Rev: v0.5.0

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Id: 4/38

Supercapacitor balancing circuit modeled after  
<https://www.eevblog.com/forum/renewable-energy/supercapacitor-balancer/>



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**Hat Labs Oy**

Sheet: /Power/Supercaps/  
 File: supercap.kicad\_sch

**Title: HALPI2**

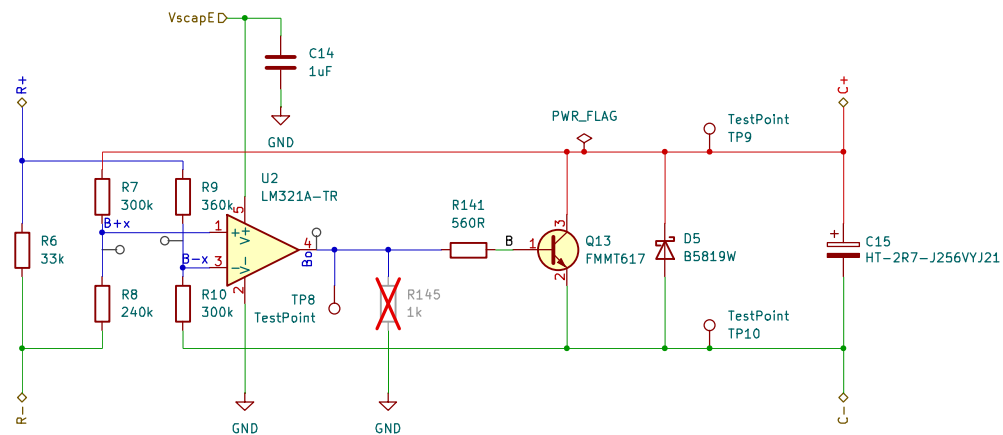
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**Hat Labs Oy**

Sheet: /Power/Supercaps/Supercap stage1/

File: supercap\_stage.kicad\_sch

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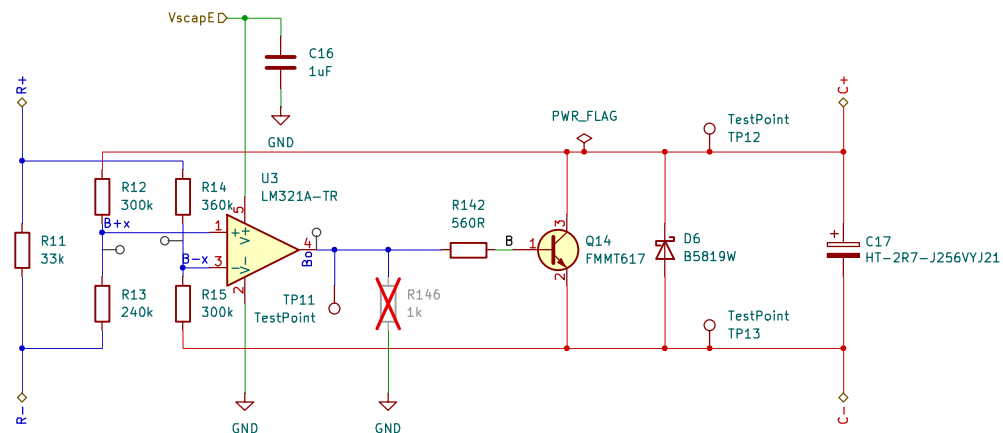
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**Hat Labs Oy**

Sheet: /Power/Supercaps/Supercap stage2/

File: supercap\_stage.kicad\_sch

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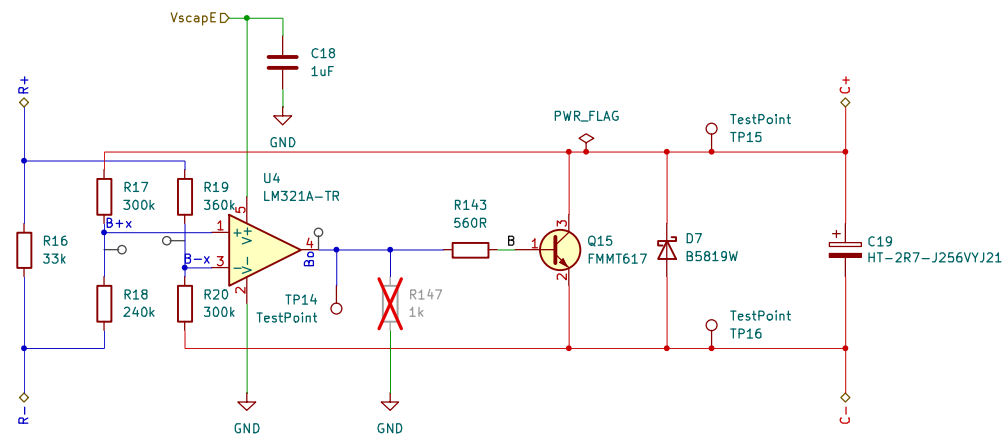
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**Hat Labs Oy**

Sheet: /Power/Supercaps/Supercap stage3/

File: supercap\_stage.kicad\_sch

**Title: HALPI2**

Size: A4

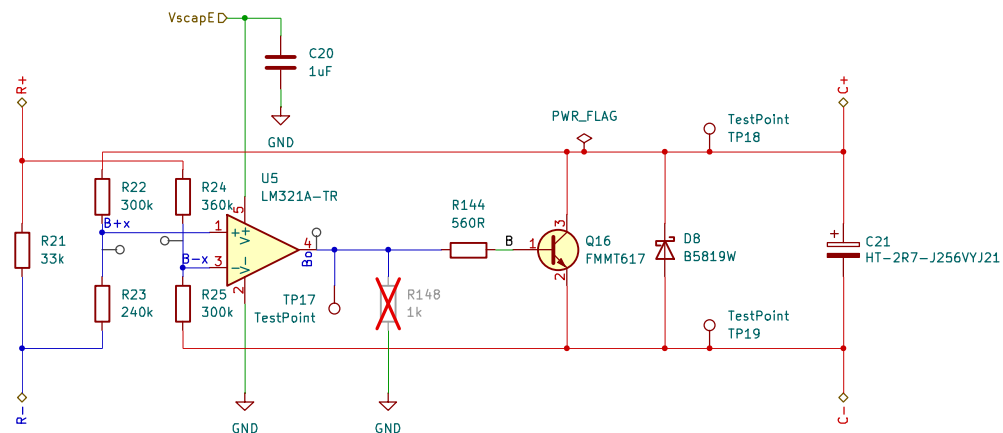
Date: 2025-08-15

Rev: v0.5.0

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**Hat Labs Oy**

Sheet: /Power/Supercaps/Supercap stage4/

File: supercap\_stage.kicad\_sch

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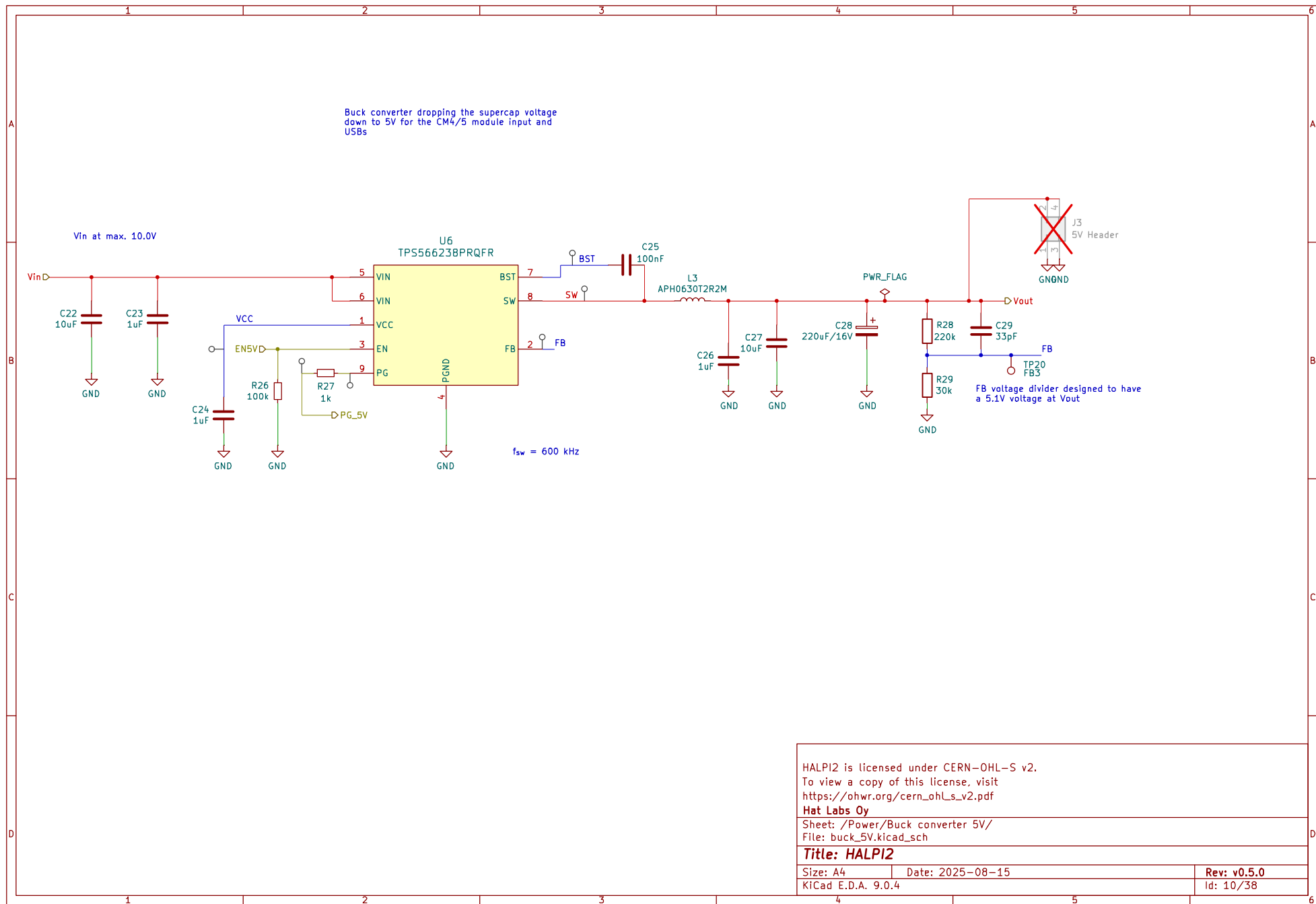
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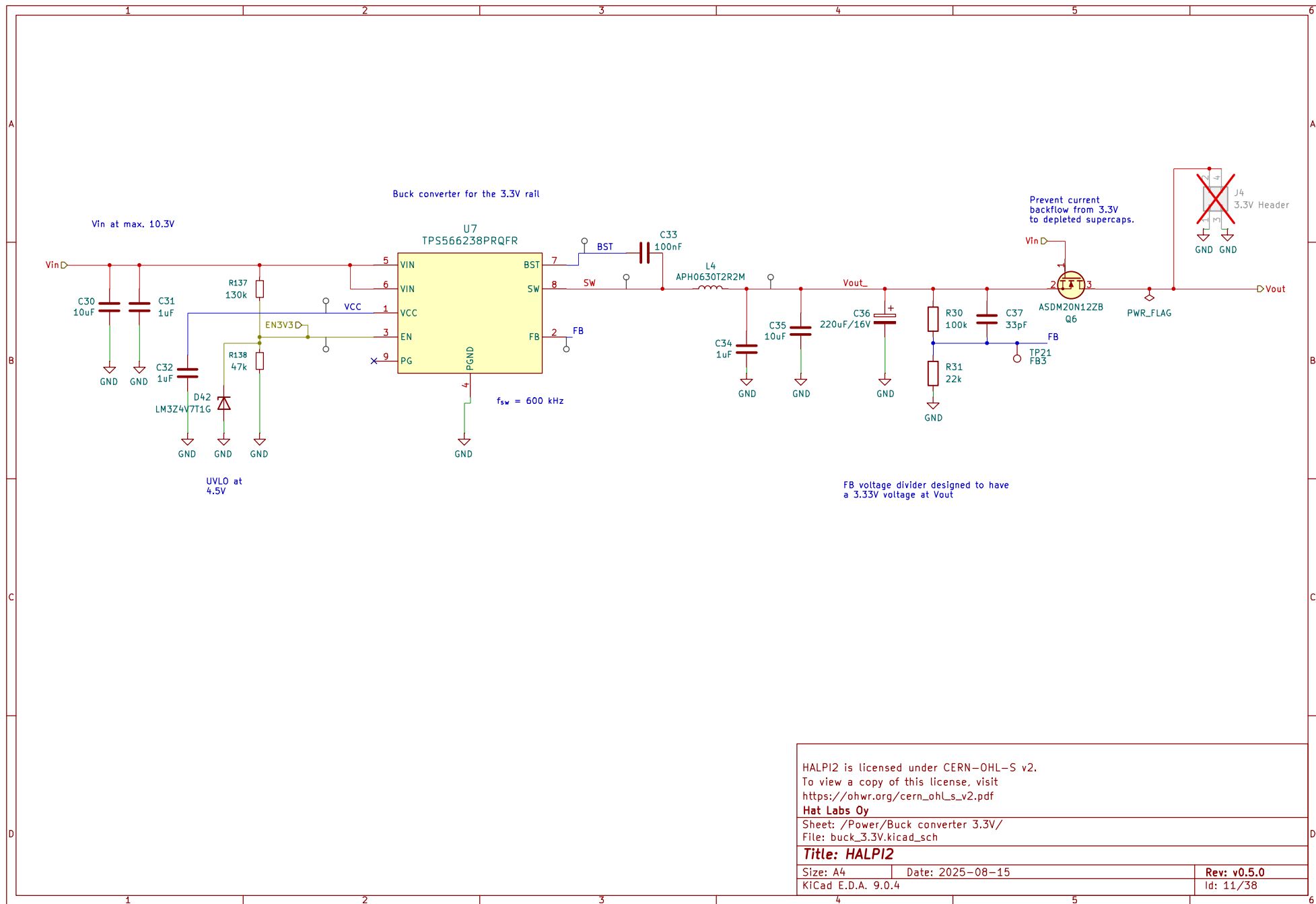
Date: 2025-08-15

Rev: v0.5.0

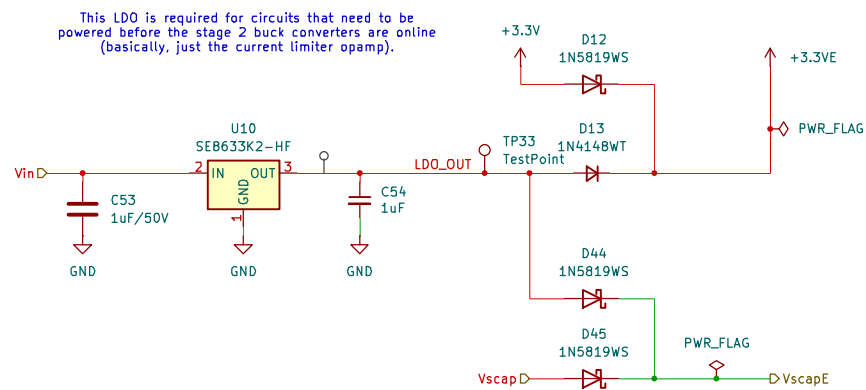
KiCad E.D.A. 9.0.4

Id: 9/38







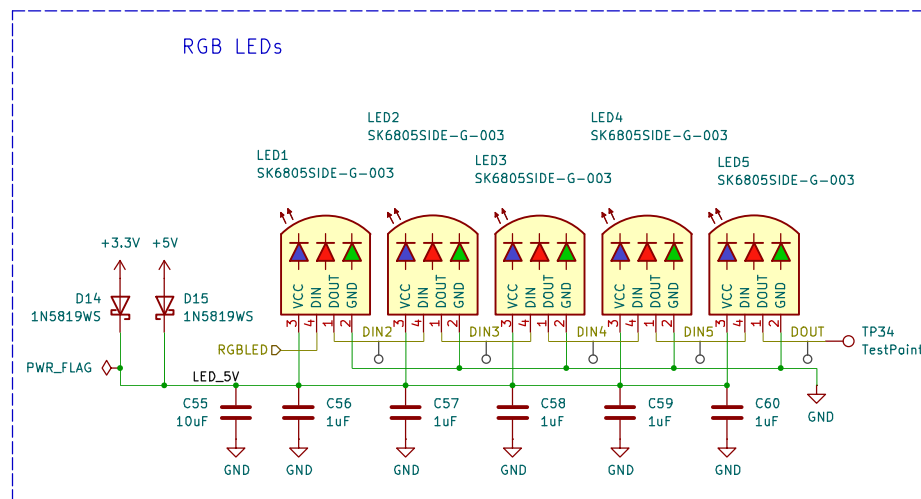


This LDO is required for circuits that need to be powered before the stage 2 buck converters are online (basically, just the current limiter opamp).

VscapE is used to ensure the supercap balancing circuit op-amps are powered immediately.

During undervoltage, TTL op-amps may be at a high state, causing all balancing NPNs to conduct before voltage is increased.

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Sheet: /Power/Early 3.3V/ File: early_3v3.kicad_sch		
<b>Title: HALPI2</b>		
Size: A4	Date: 2025-08-15	Rev: v0.5.0
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**Hat Labs Oy**

Sheet: /Controller/RGB LEDs/  
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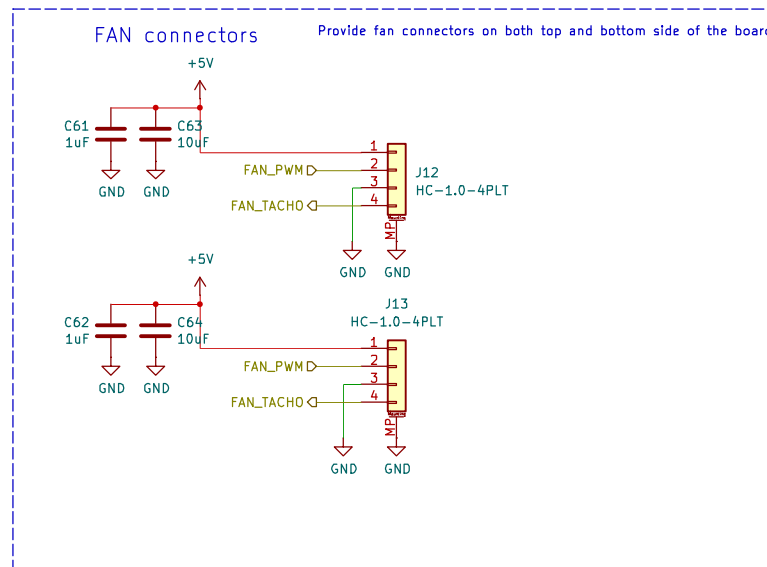
Date: 2025-08-15

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**Hat Labs Oy**

Sheet: /CM4 GPIO/Fan Connectors/

File: fan\_connectors.kicad\_sch

**Title: HALPI2**

Size: A4

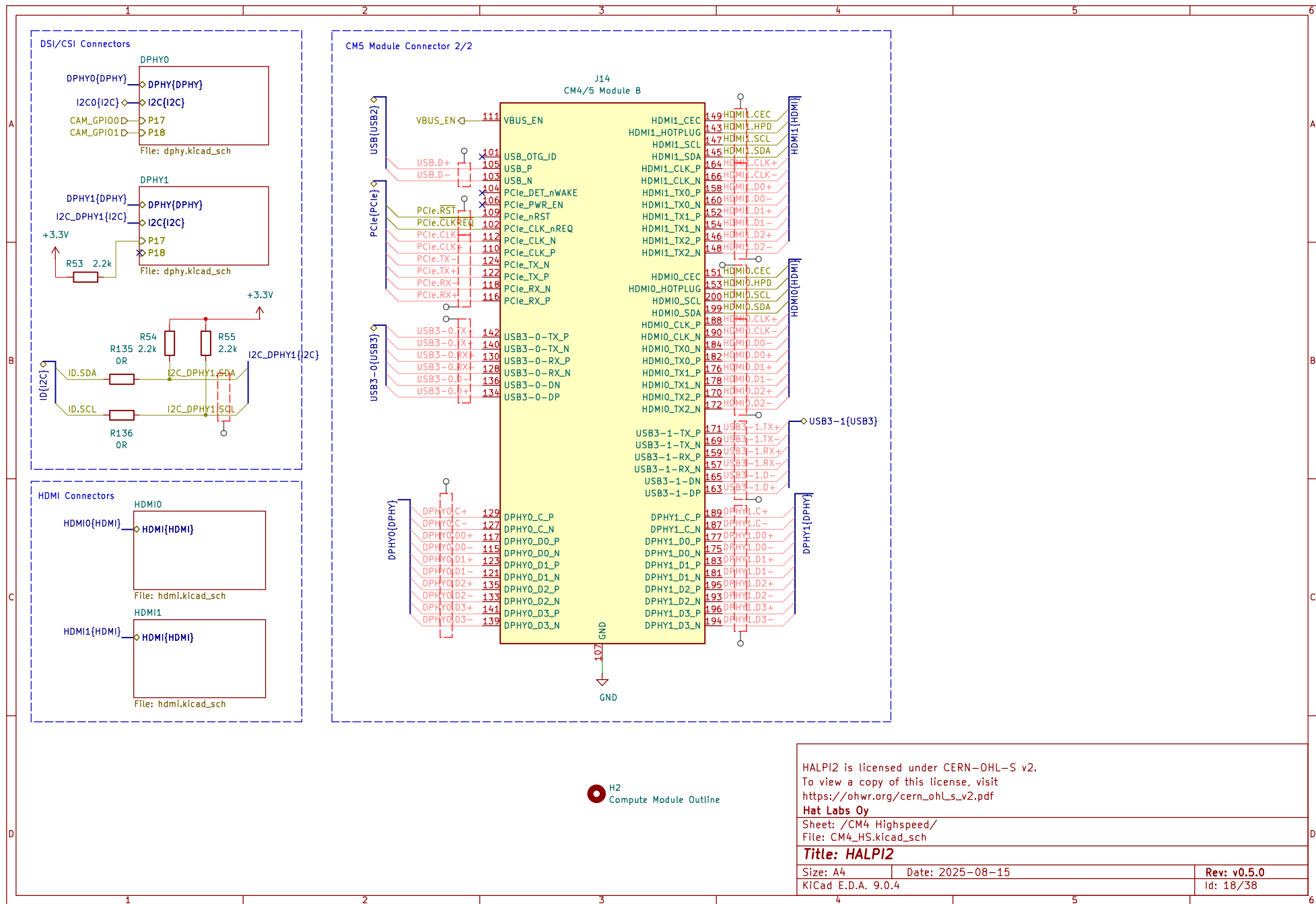
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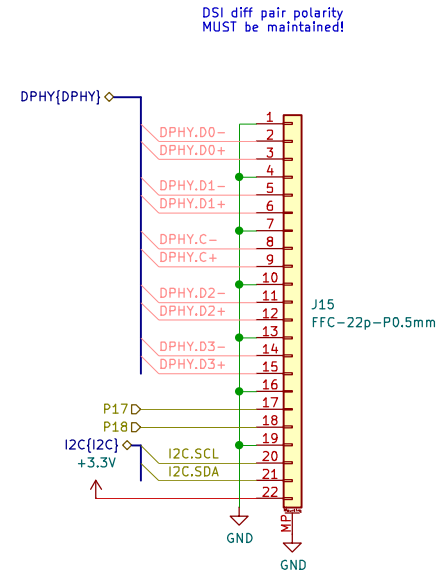
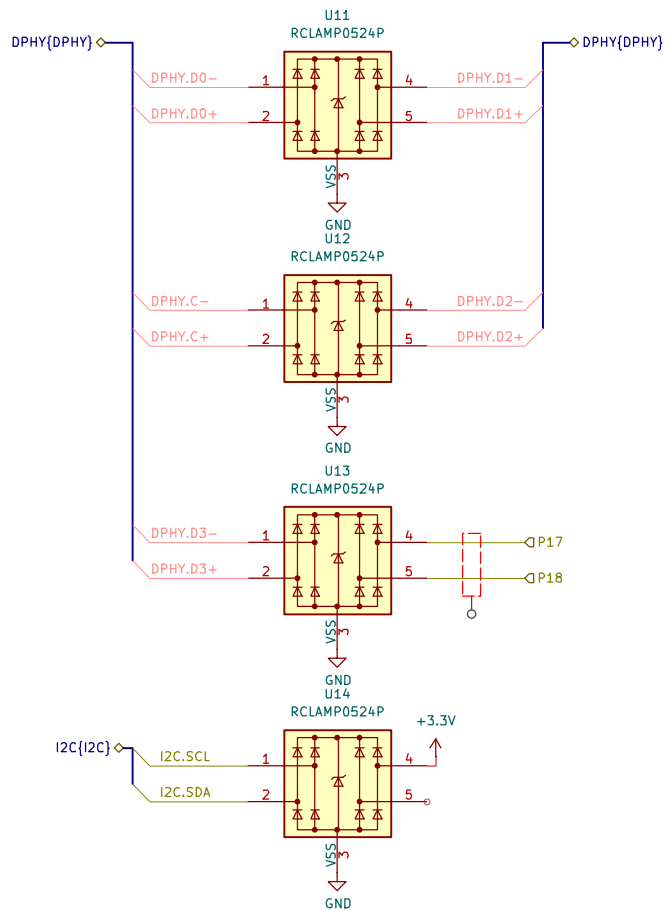
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Sheet: /CM4 Highspeed/DPHY0/  
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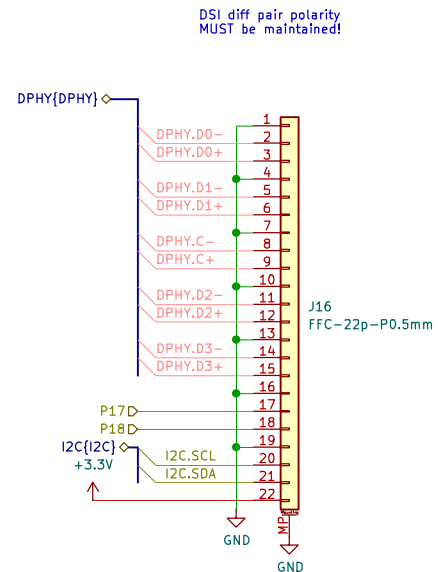
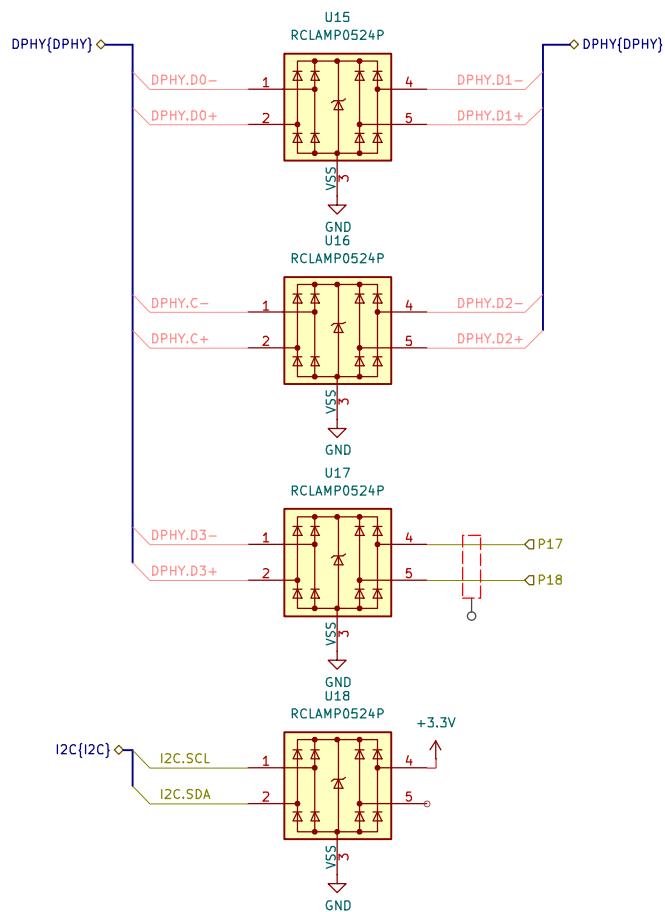
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Date: 2025-08-15

Rev: v0.5.0

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**Hat Labs Oy**

Sheet: /CM4 Highspeed/DPHY1/  
File: dphy.kicad\_sch

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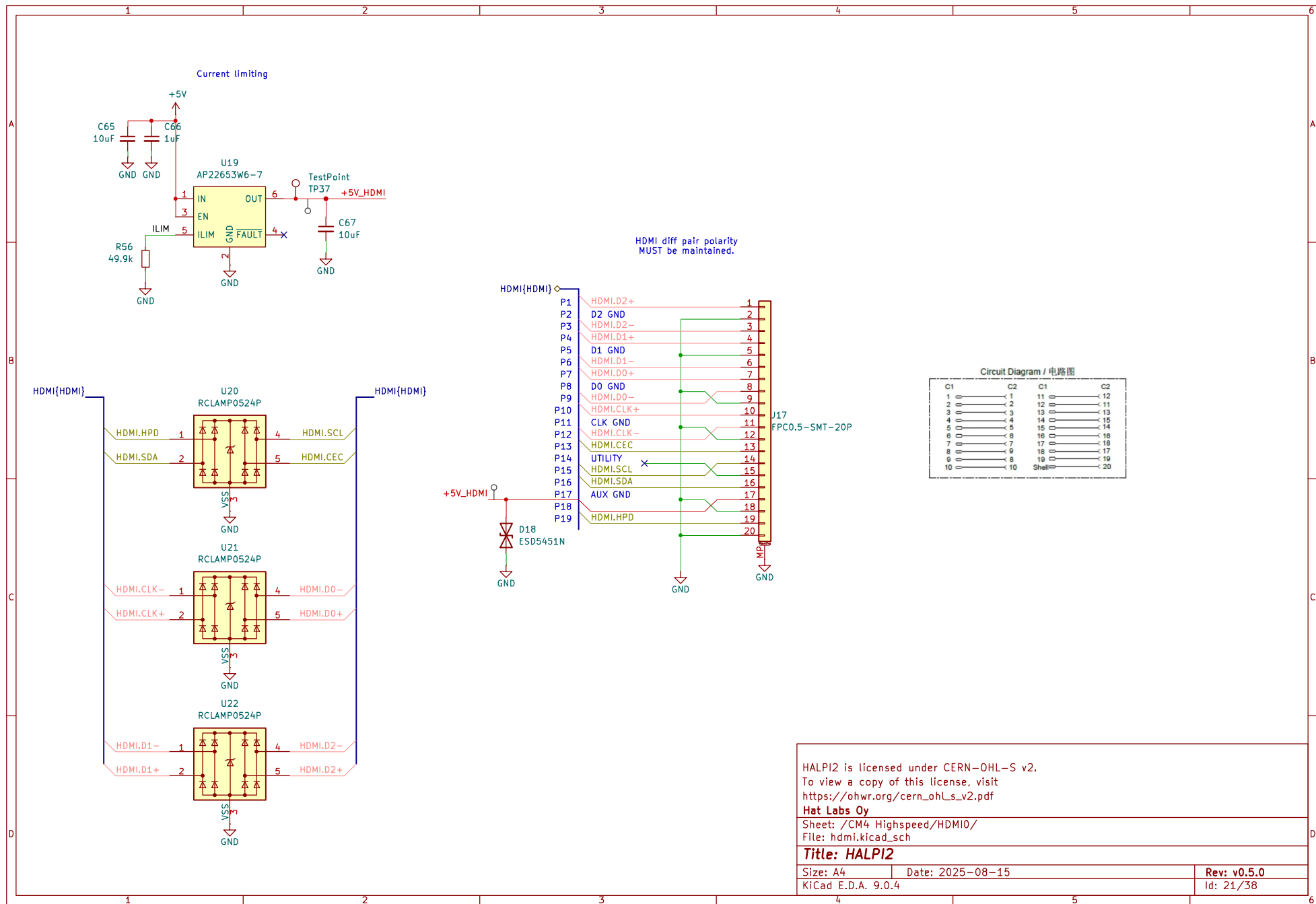
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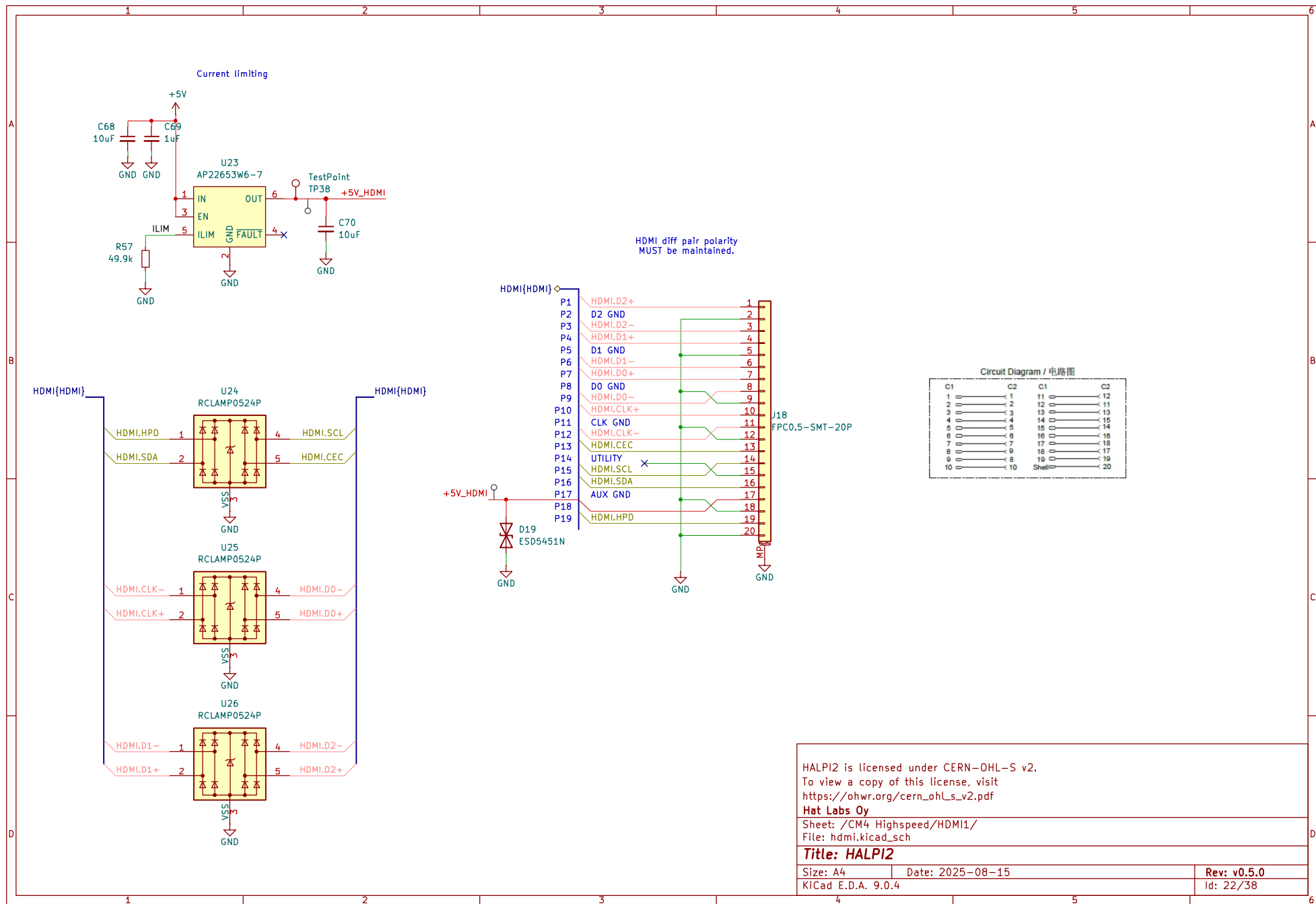
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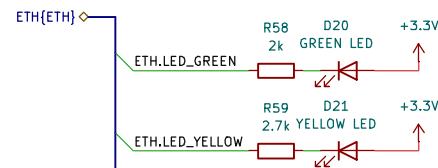
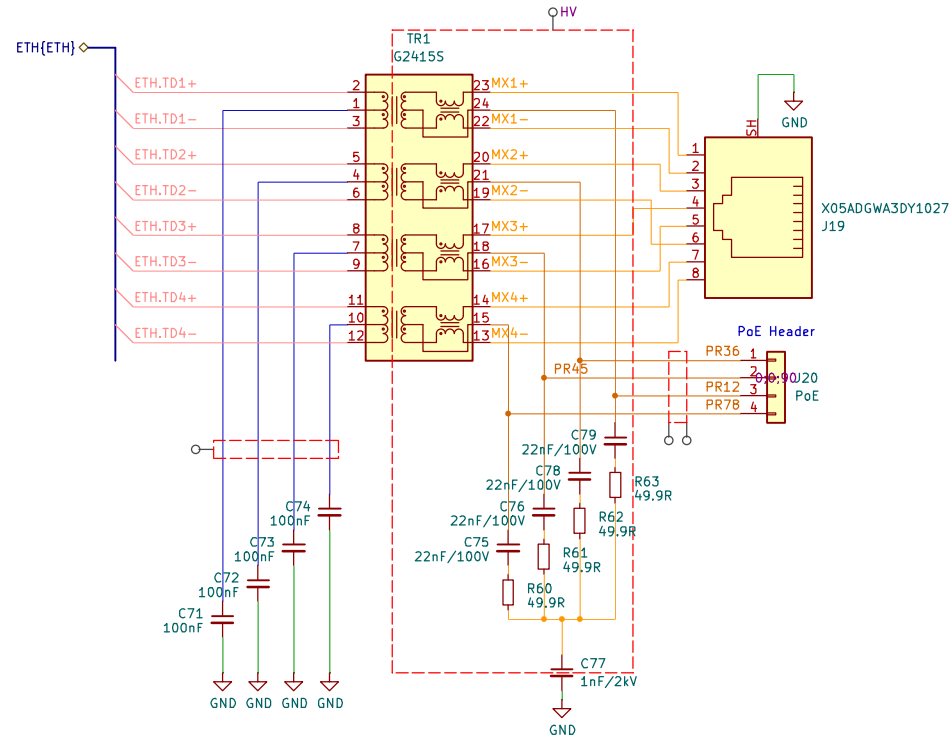
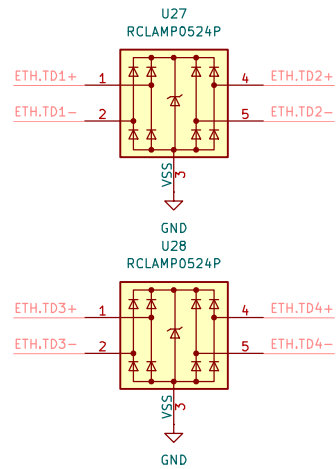
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 File: Ethernet.kicad\_sch

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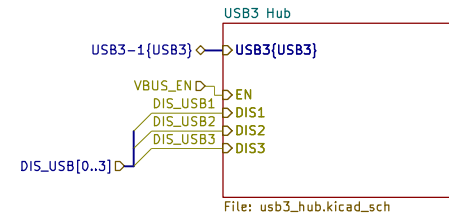
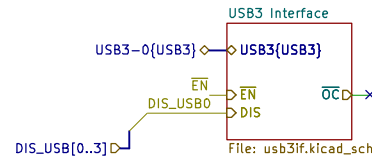
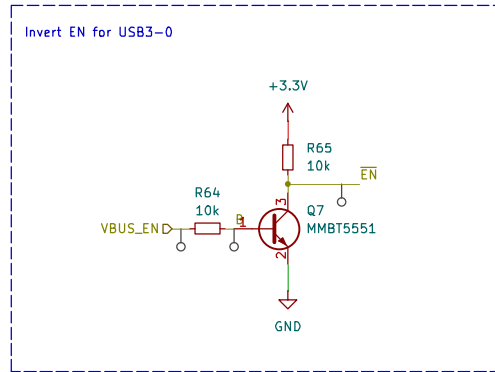
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Date: 2025-08-15

Rev: v0.5.0

KiCad E.D.A. 9.0.4

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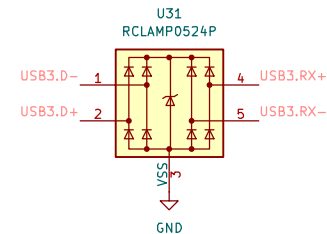
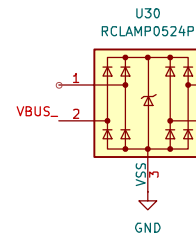
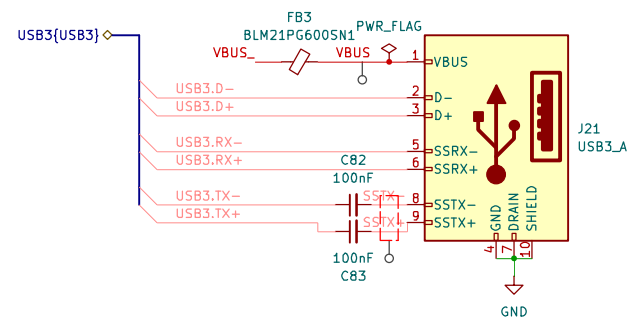
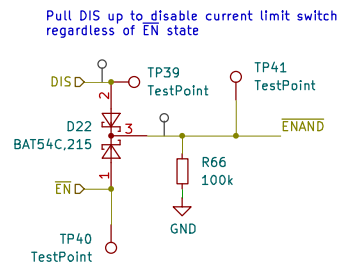
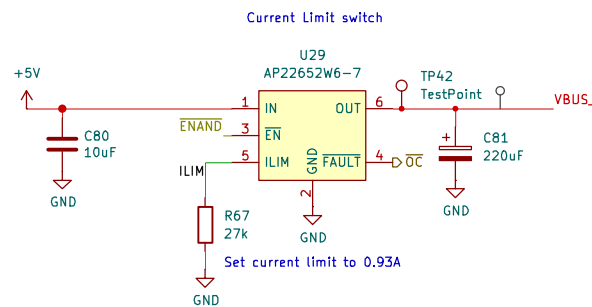
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**Hat Labs Oy**

Sheet: /USB3/  
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**Title: HALPI2**

Size: A4	Date: 2025-08-15	Rev: v0.5.0
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**Hat Labs Oy**

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**Title: HALPI2**

Size: A4

Date: 2025-08-15

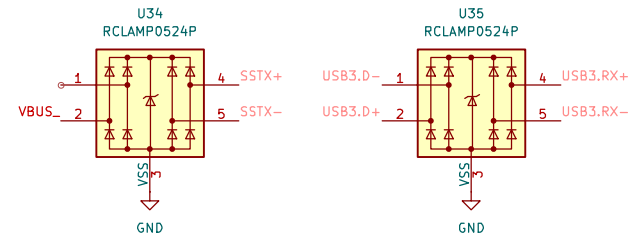
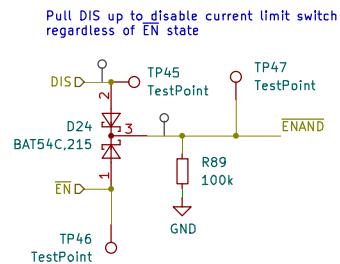
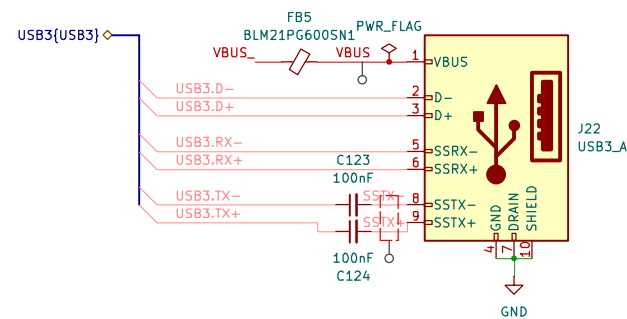
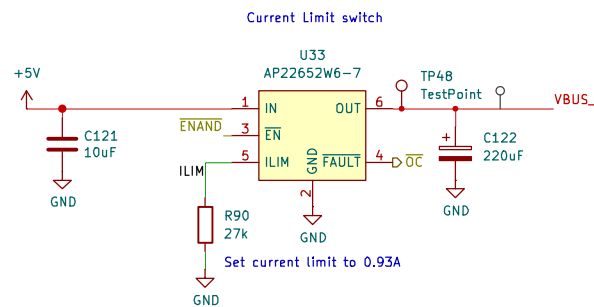
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**Hat Labs Oy**

Sheet: /USB3/USB3 Hub/USB3 Interface1/  
File: usb3if.kicad\_sch

**Title: HALPI2**

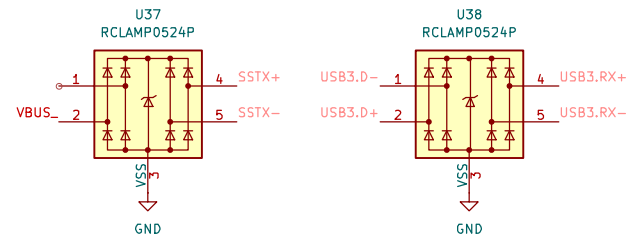
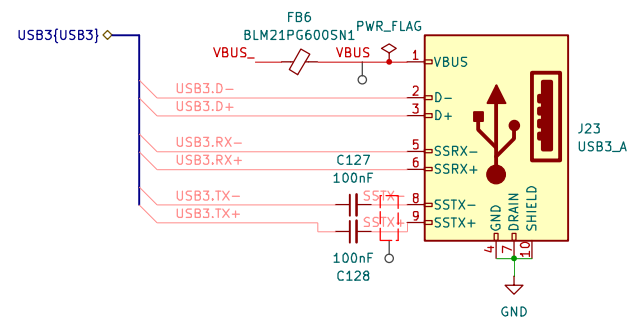
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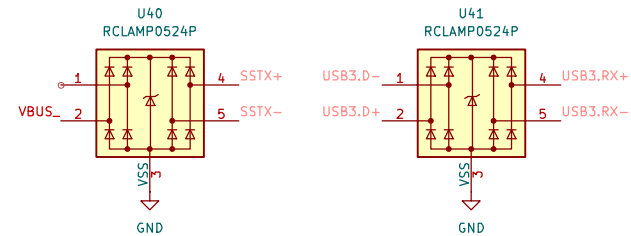
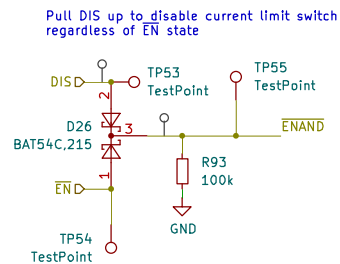
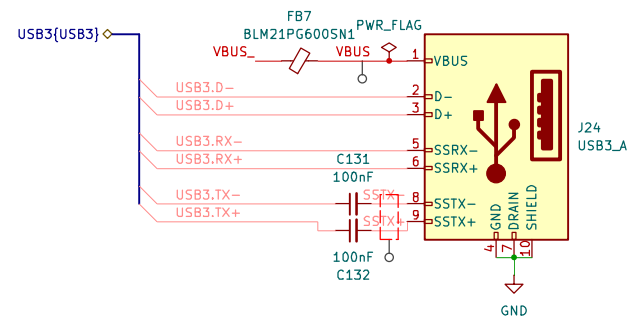
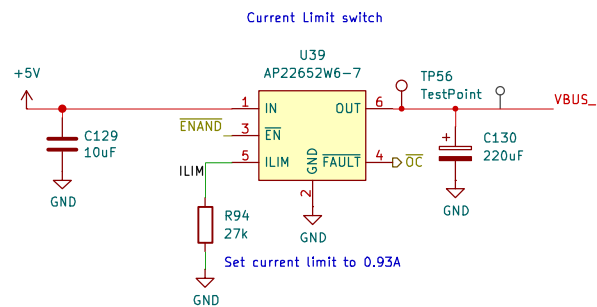
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**Hat Labs Oy**

Sheet: /USB3/USB3 Hub/USB3 Interface3/

File: usb3if.kicad\_sch

**Title: HALPI2**

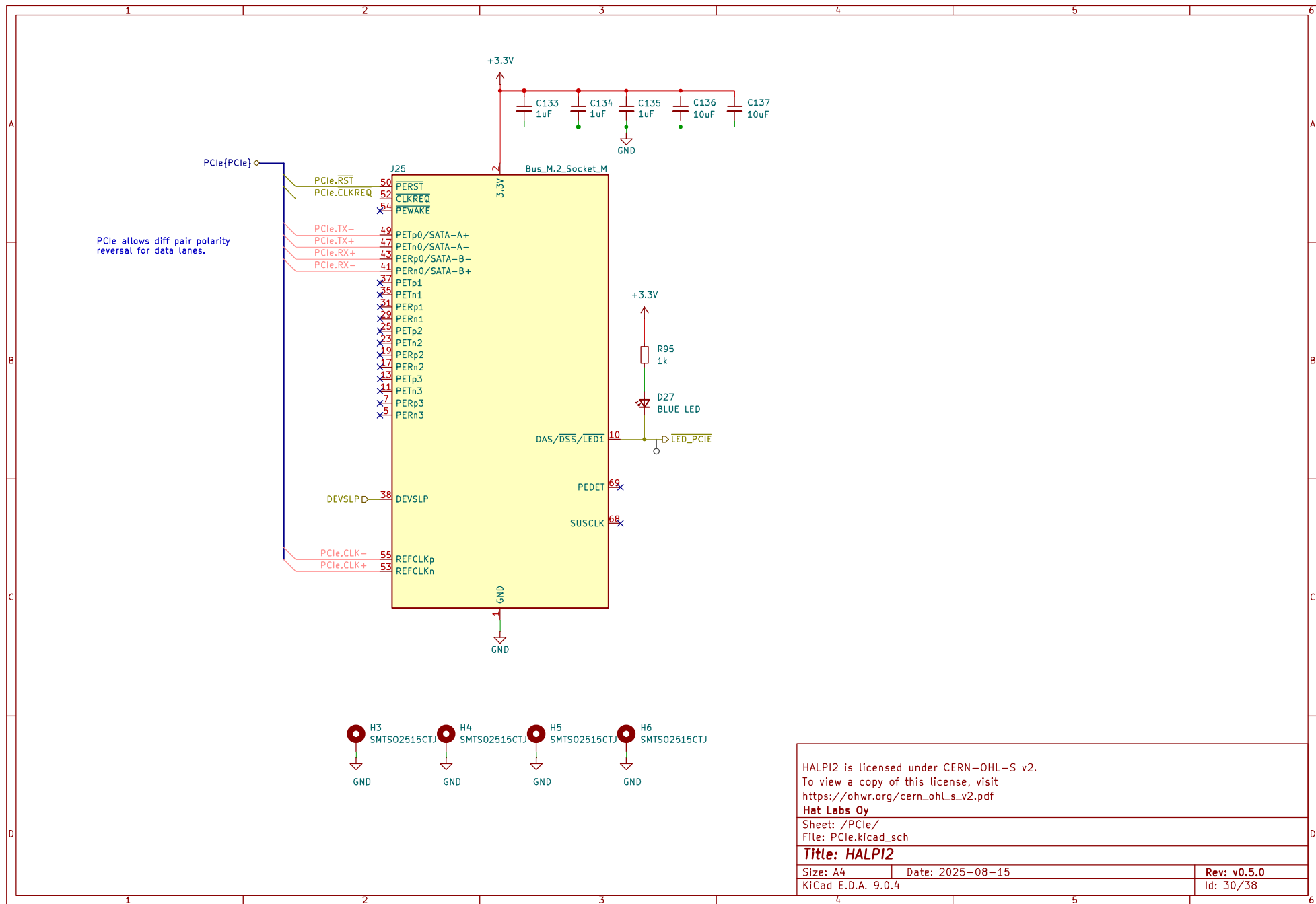
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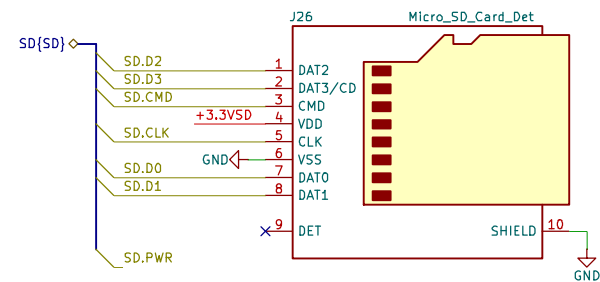
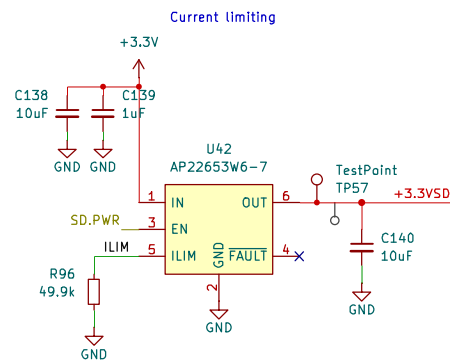
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**Hat Labs Oy**

Sheet: /SDCard/

File: SDCard.kicad\_sch

**Title: HALPI2**

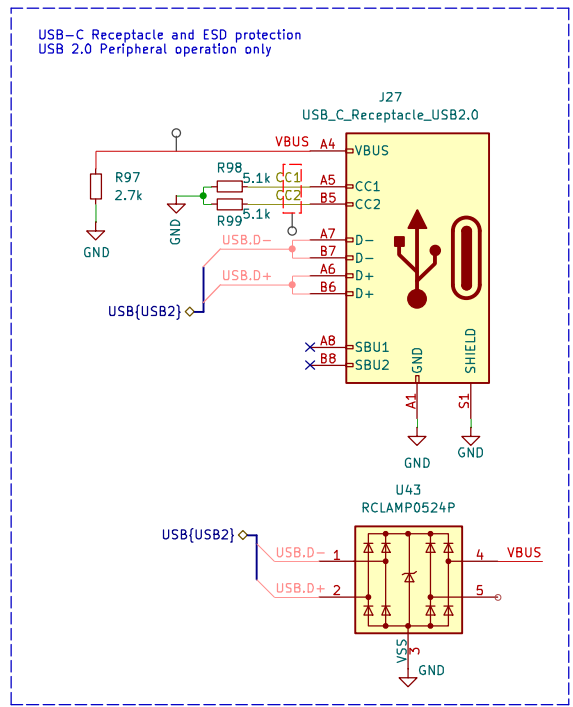
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Date: 2025-08-15

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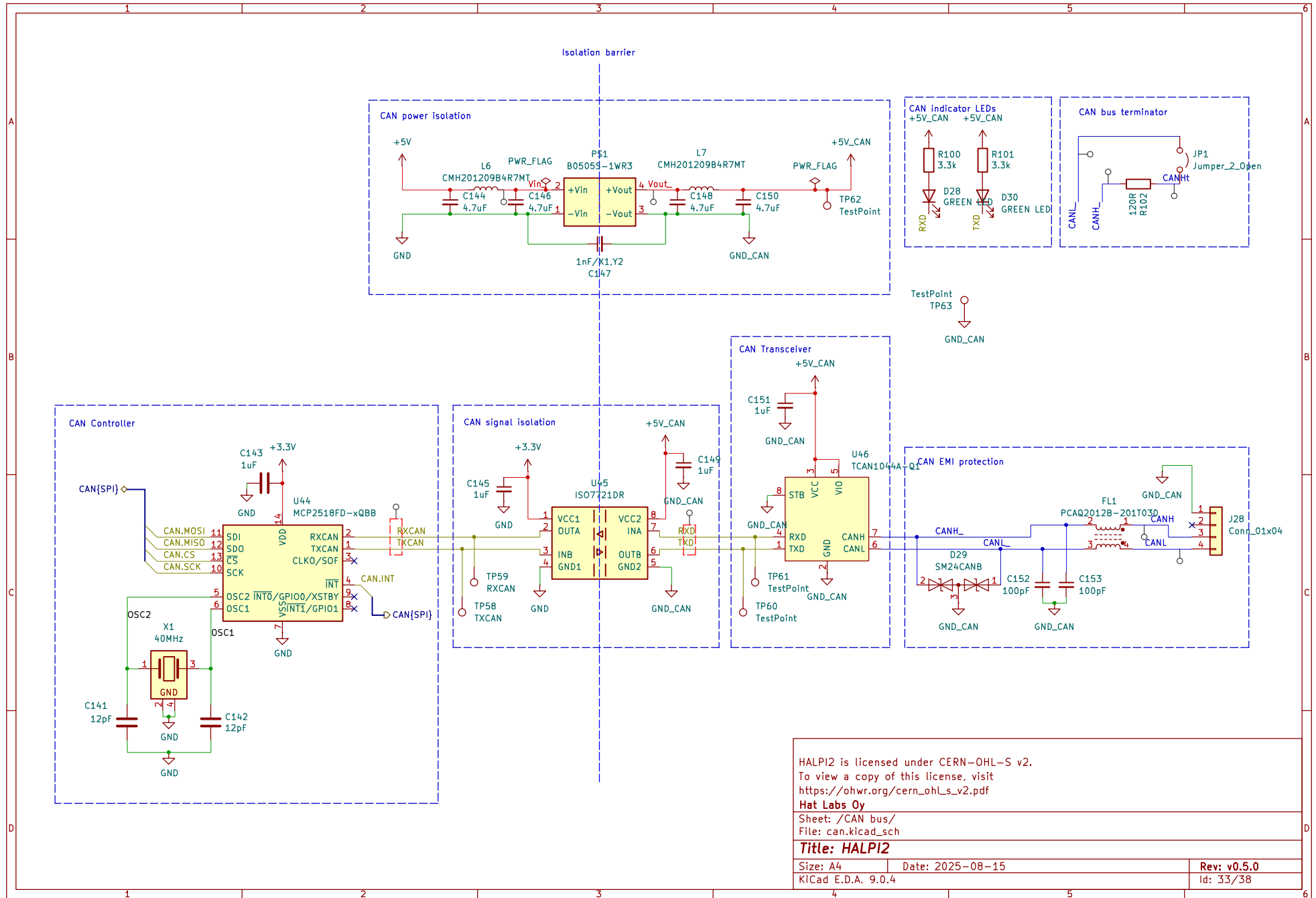
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**Hat Labs Oy**

Sheet: /USB 2.0 Peripheral Interface/  
File: USB2.kicad\_sch

**Title: HALPI2**

Size: A4	Date: 2025-08-15	Rev: v0.5.0
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**Hat Labs Oy**

Sheet: /CAN bus/  
 File: can.kicad\_sch

**Title: HALPI2**

Size: A4

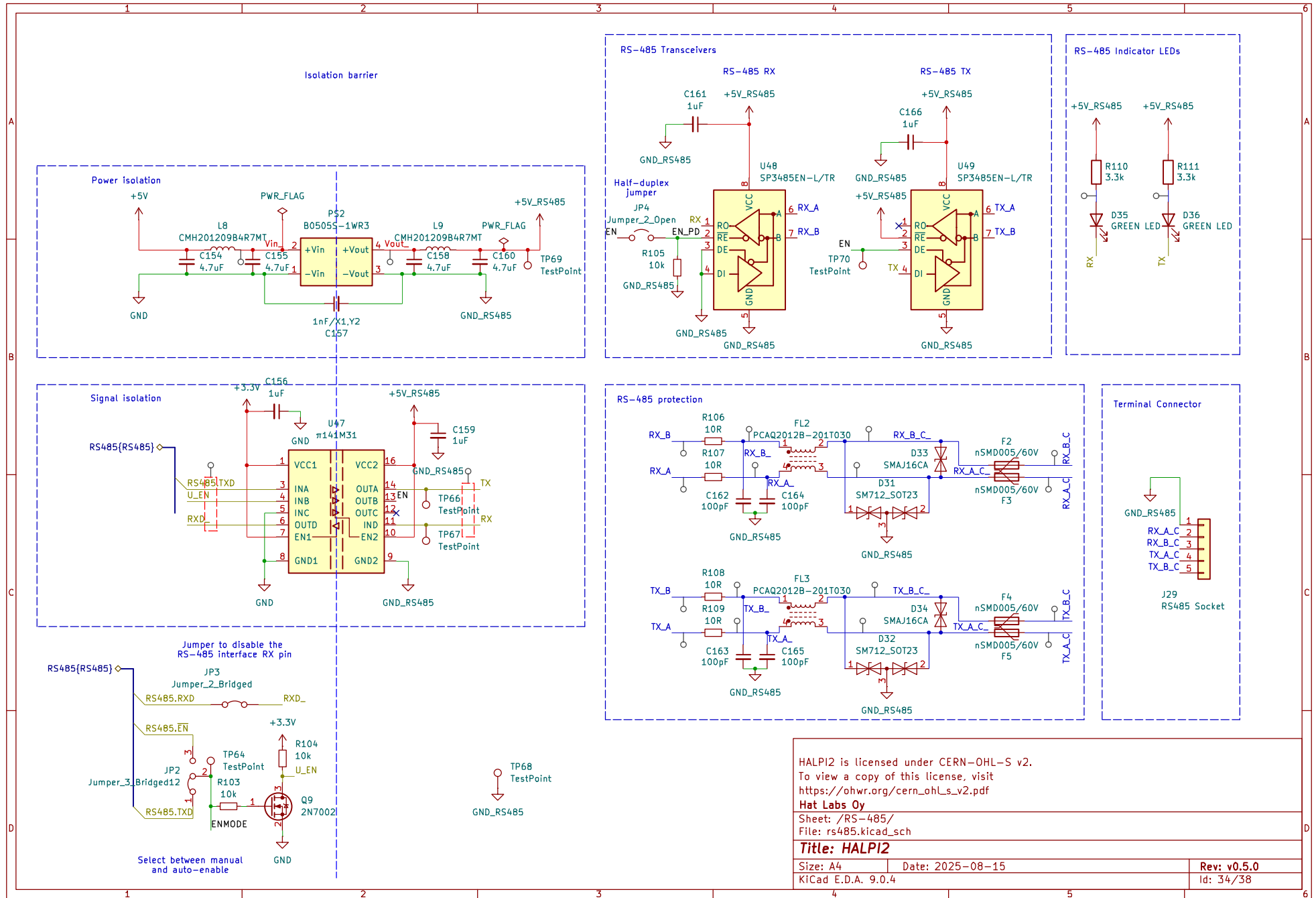
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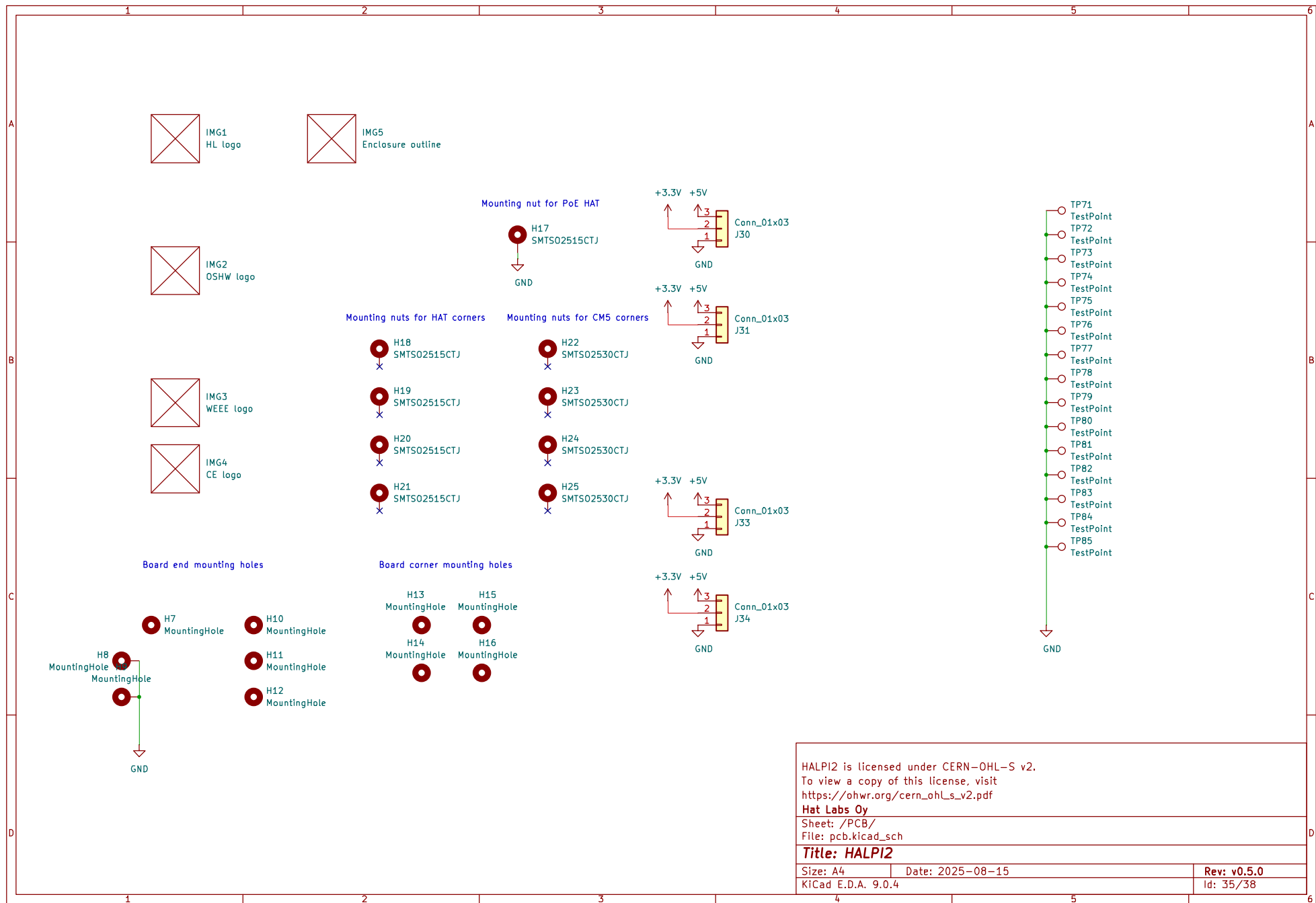
Rev: v0.5.0

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**Hat Labs Oy**

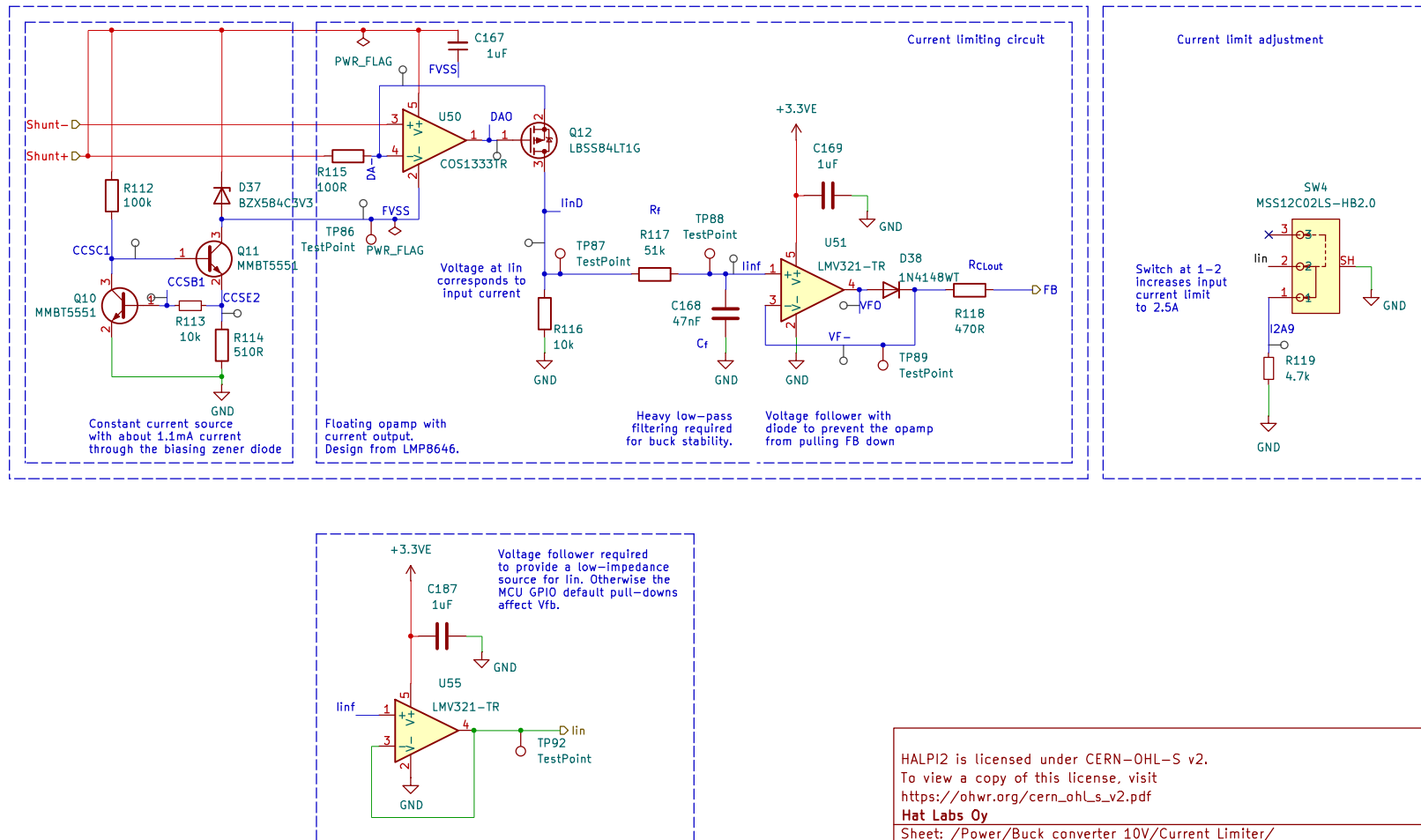
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Size: A4  
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**Hat Labs Oy**

Sheet: /Power/Buck converter 10V/Current Limiter/  
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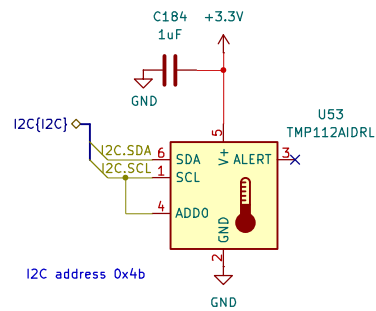
Date: 2025-08-15

Rev: v0.5.0

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**Hat Labs Oy**

Sheet: /Controller/Temperature Sensor/

File: temp\_sensor.kicad\_sch

**Title: HALPI2**

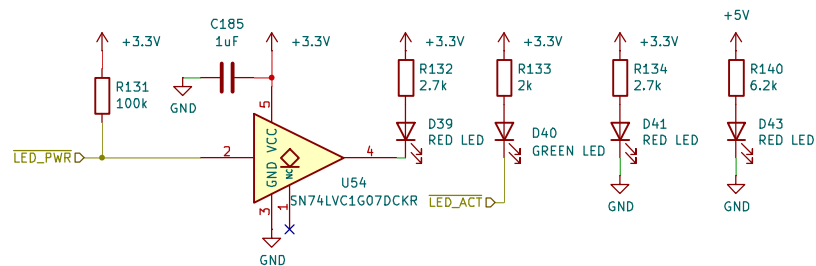
Size: A4

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