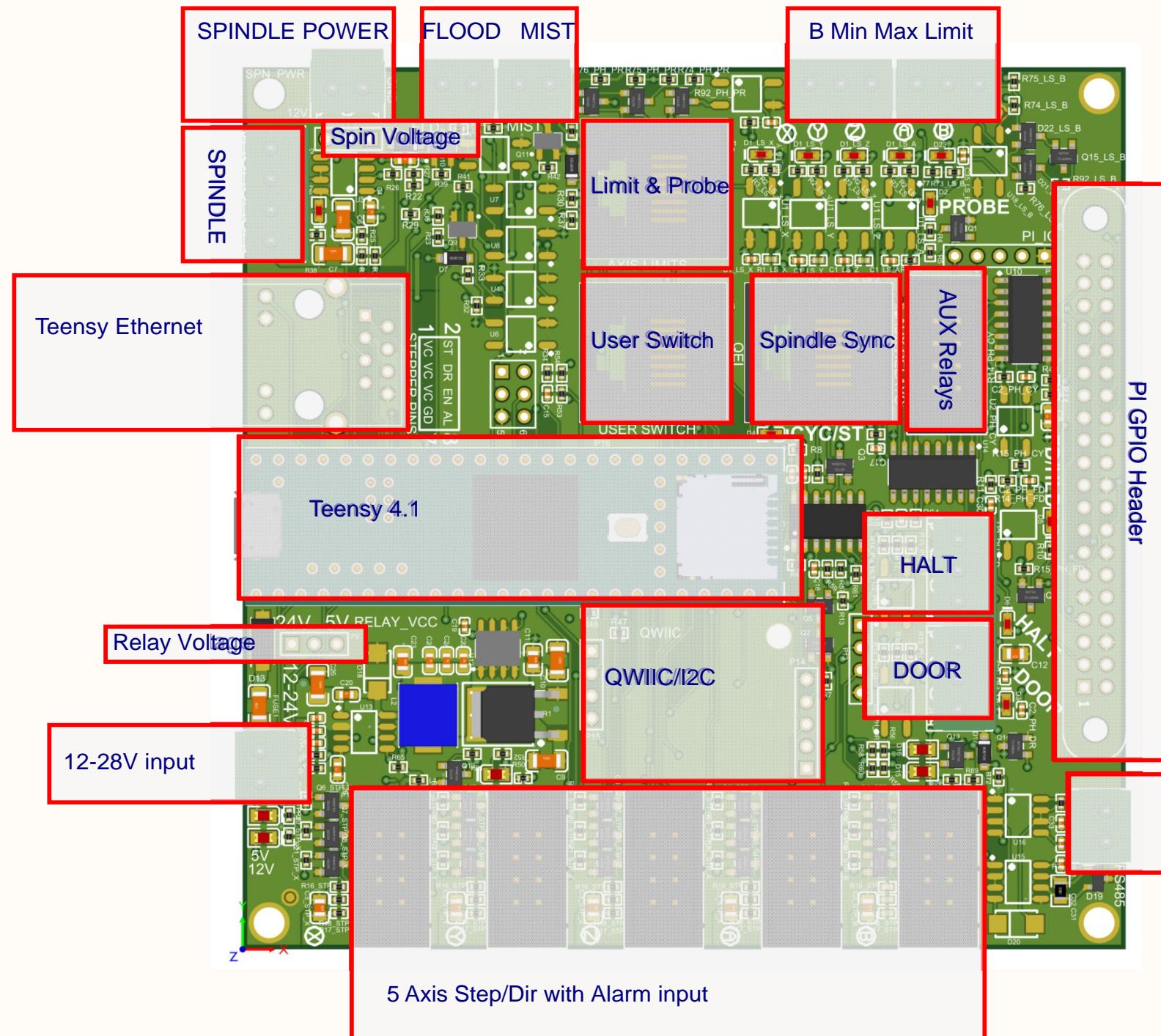


# GRBLHAL2000 EST



## Mechanical

PCB LOGO  
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FID1 FID2 FID3

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Title Sheet	
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ENGR	DOCUMENT
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	1 / 14

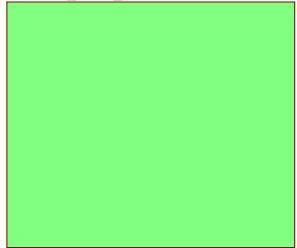
## Top Level Design

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U\_Title Sheet  
Title Sheet.SchDoc

U\_Change Log  
Change Log.SchDoc

U\_PrintNC\_BREAKOUT  
PrintNC\_CNC\_Breakout.SchDoc

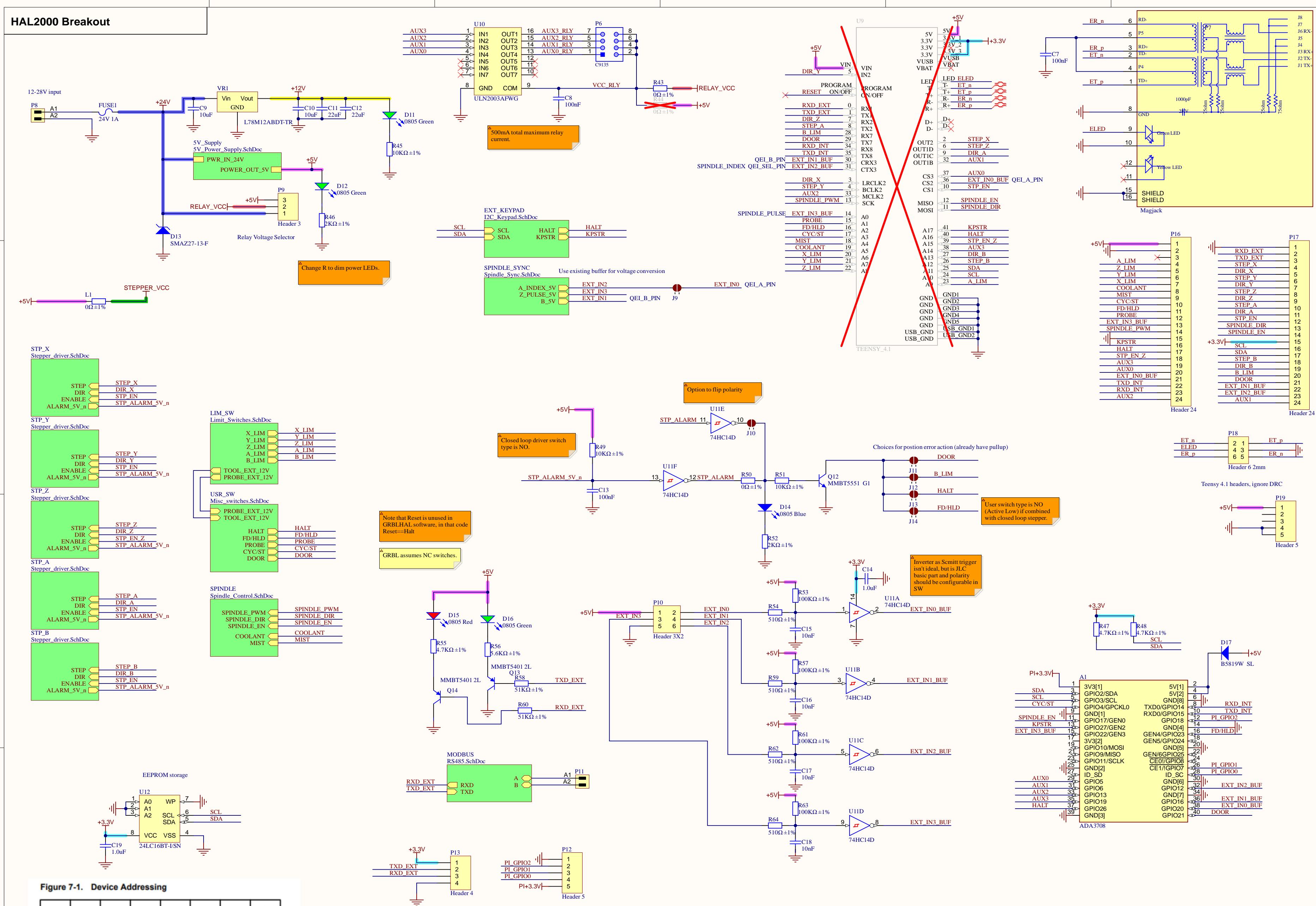


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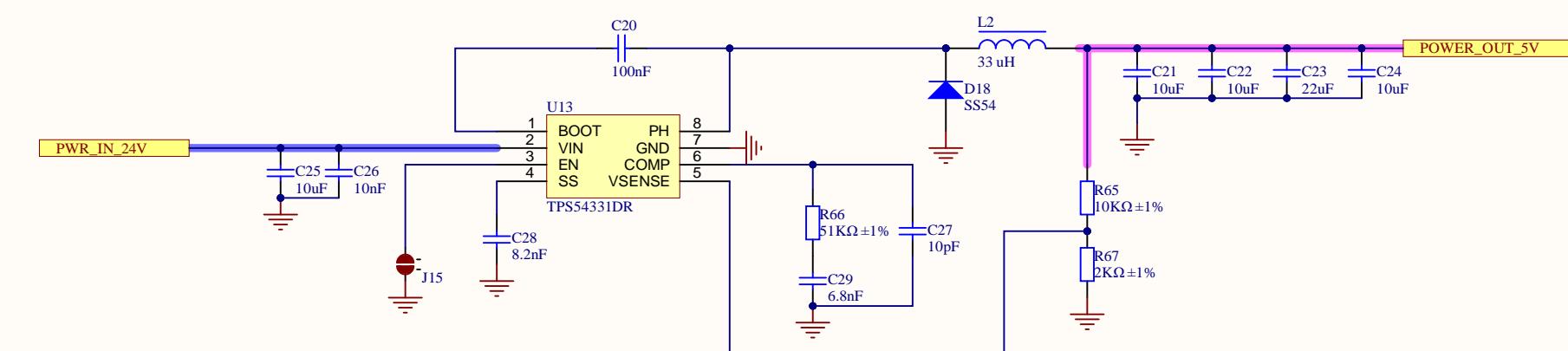
**Figure 7-1.** Device Addressing

1	0	1	0	A2	A1	A0	R/W
MSB							LSD

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# 5V Power Supply



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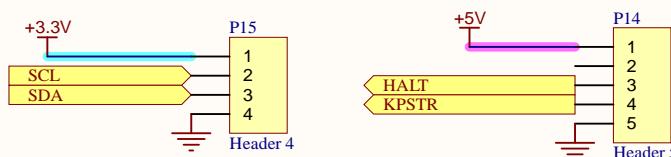


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AM	5V_Power_Supply.SchDoc
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	4 / 14

# QWIIC I2C Keypad

<sup>A</sup> Due to supply issues, starting with revision A5 the QWIIC RJ45 connector is removed and replaced with headers. This allows alternate uses of the I2C header



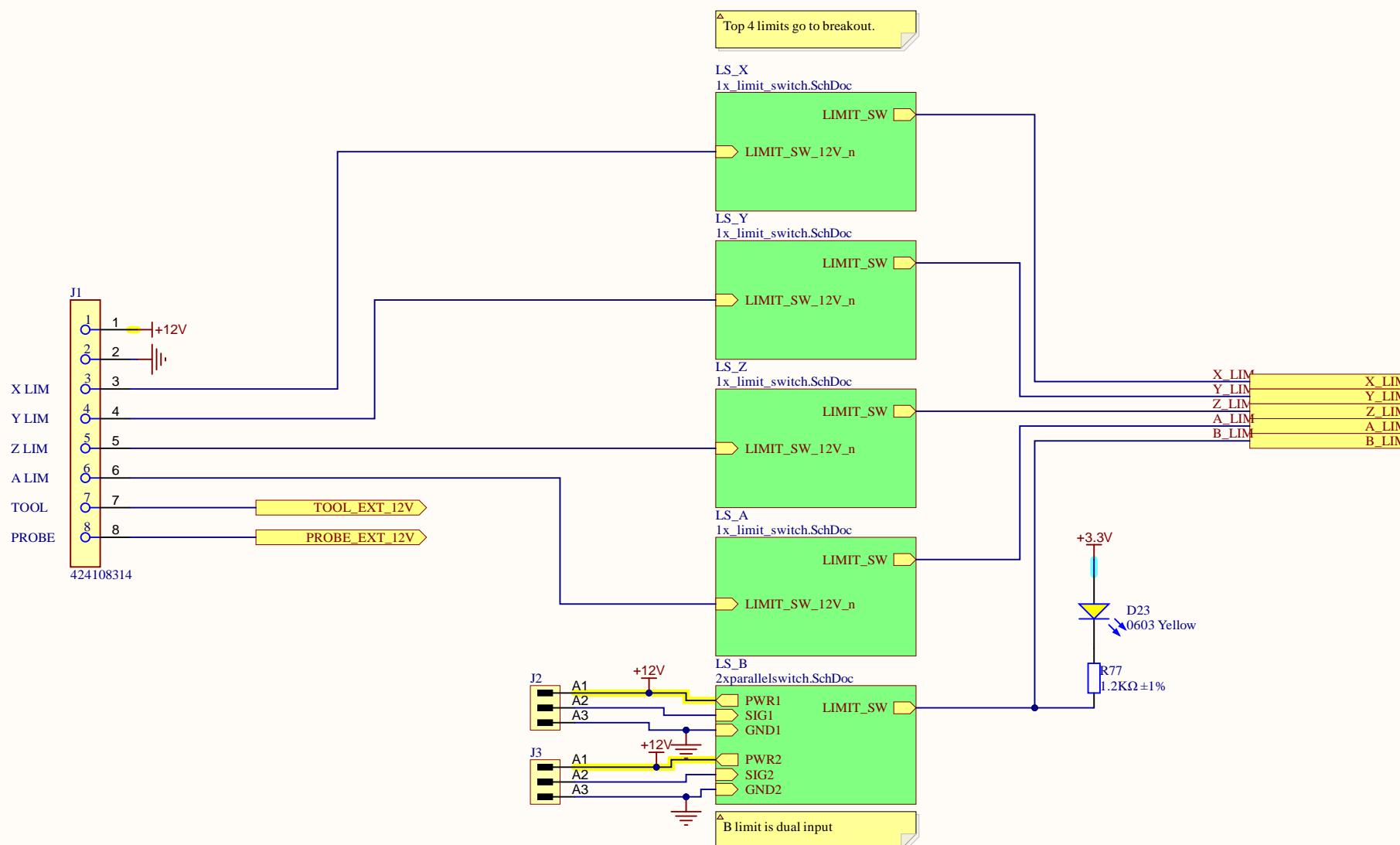
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QWIIC I2C Keypad	
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# Limit Switches



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ENGR	DOCUMENT		
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			5 / 14

## Limit Switch XOR

A

A

B

B

C

C

D

D

1

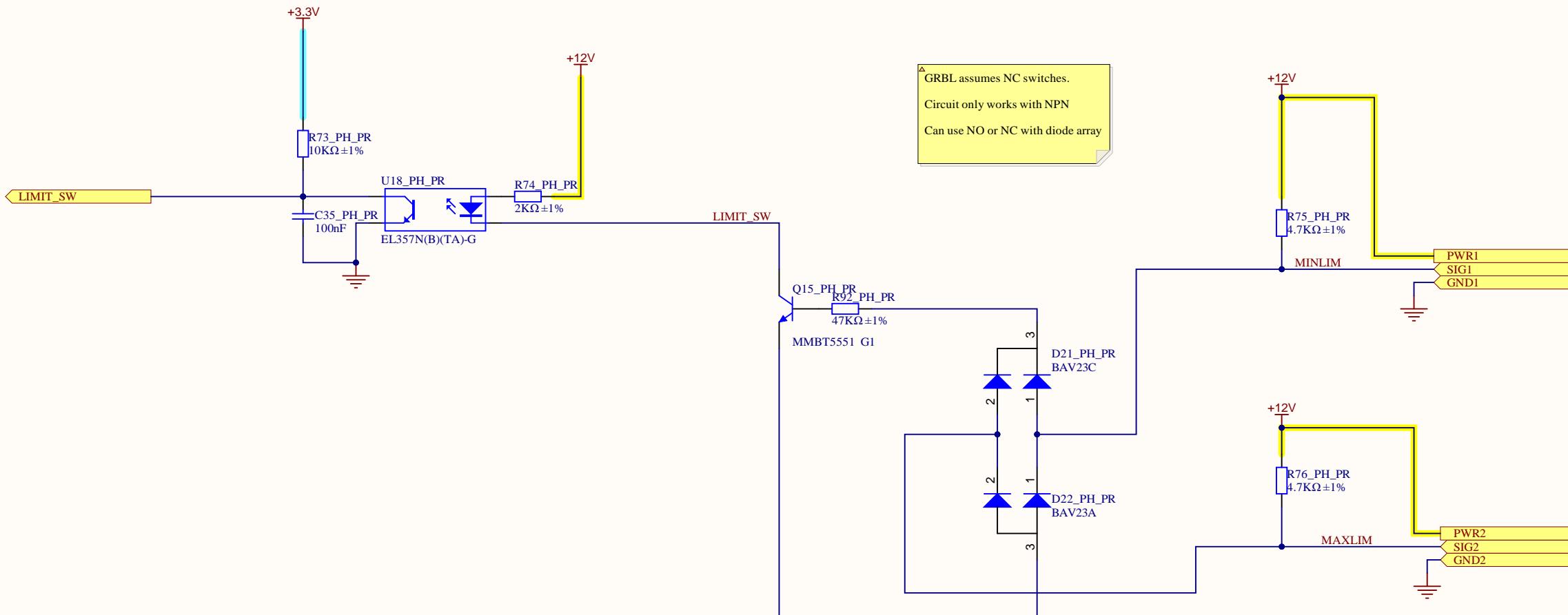
2

3

4

5

6



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PrintNC_GRBLHAL_BreakoutApjPCB		2xparallelswitch.SchDoc	
AM			
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# Single Limit Switch

A

A

B

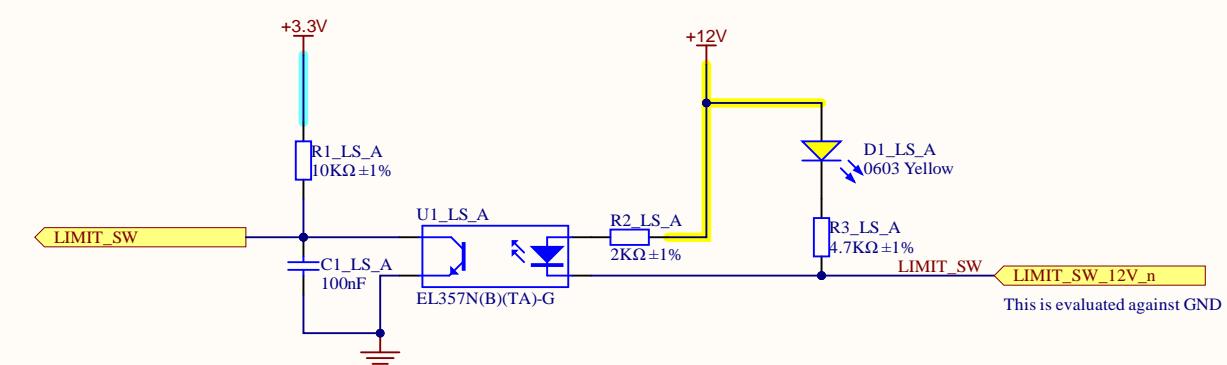
B

C

C

D

D



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ENGR	DOCUMENT
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AM	1x_limit_switch.SchDoc
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	SHEET 6 / 14

**Single Limit Switch**

A

A

B

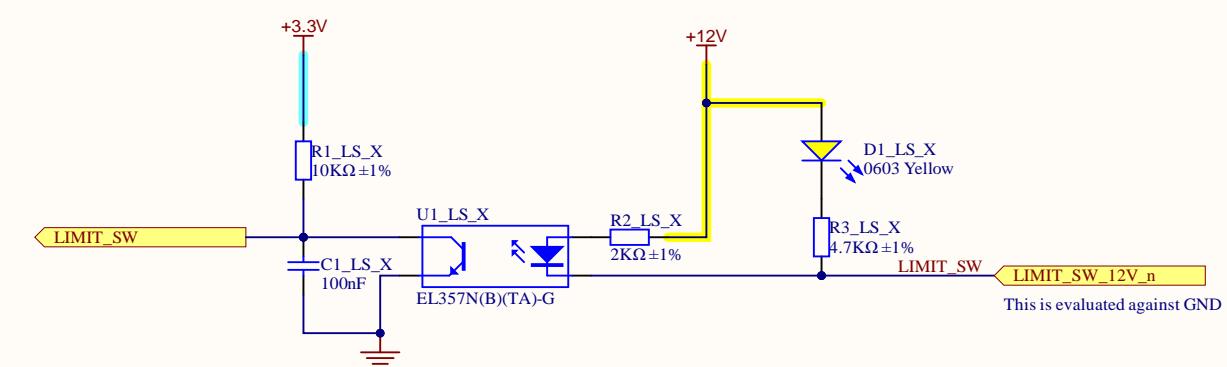
B

C

C

D

D



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AM	1x_limit_switch.SchDoc
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**Single Limit Switch**

A

A

B

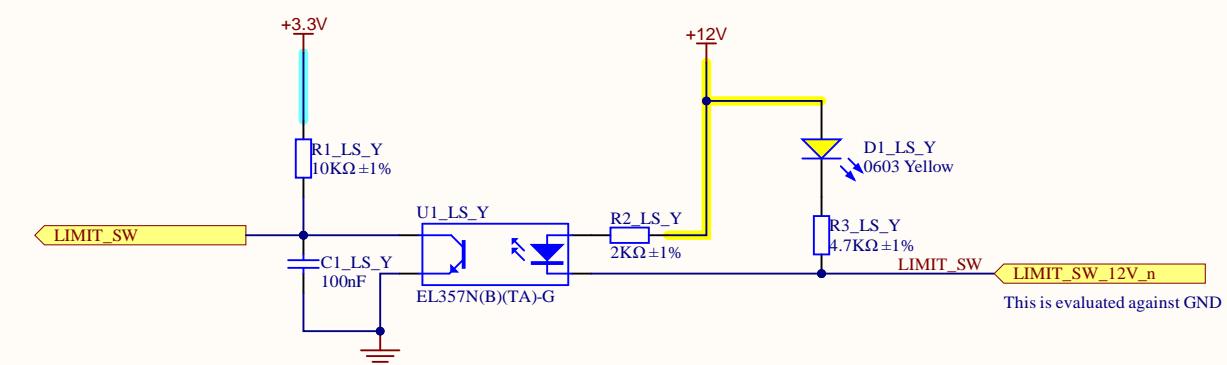
B

C

C

D

D



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AM	1x_limit_switch.SchDoc
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# Single Limit Switch

A

A

B

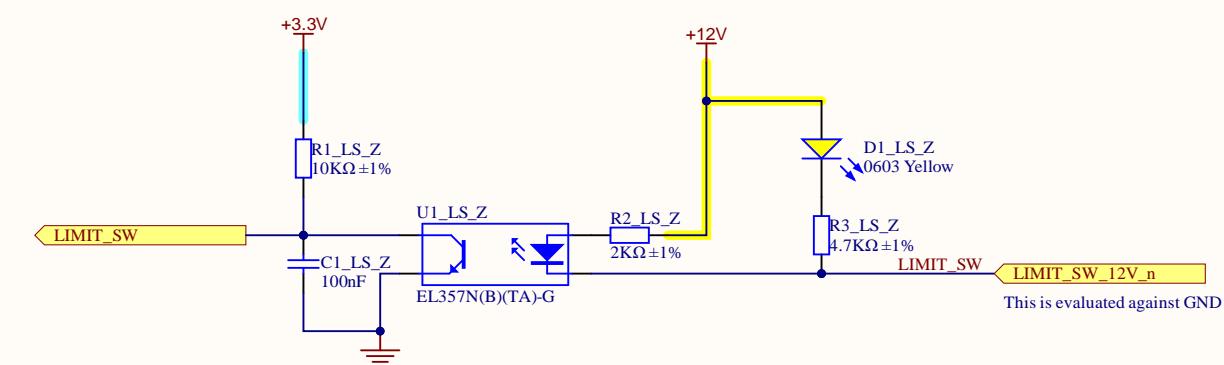
B

C

C

D

D



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**Limit Switch XOR**

A

A

B

B

C

C

D

D

1

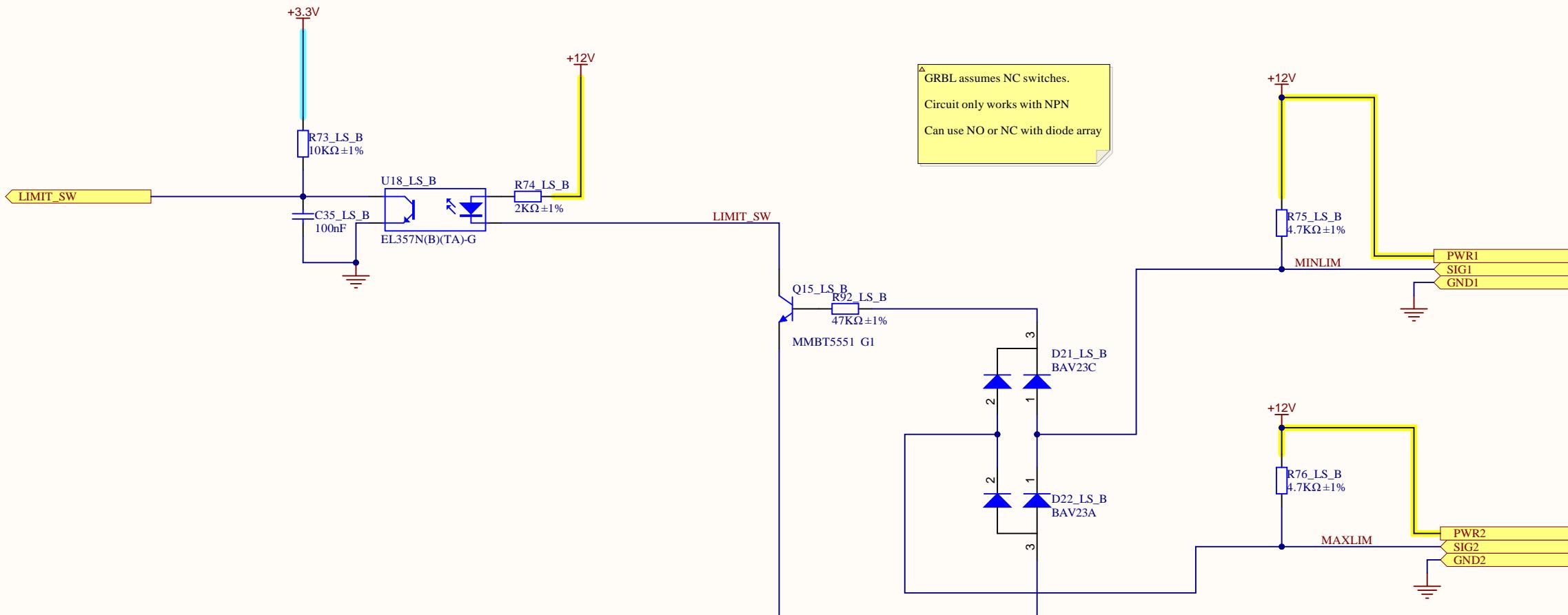
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3

4

5

6



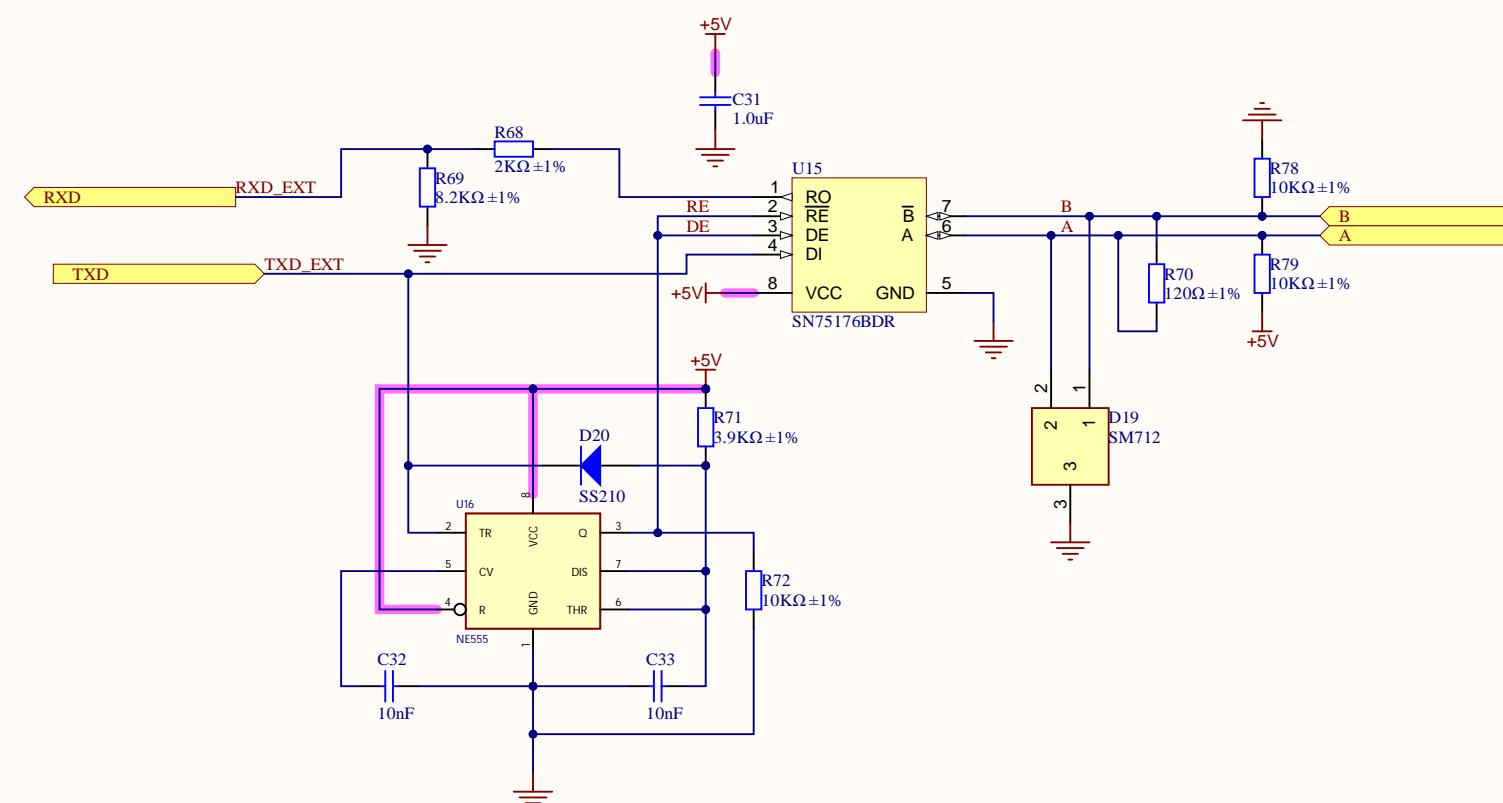
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PROJECT	REV	DOCUMENT	FILE
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2xparallelswitch.SchDoc			
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A



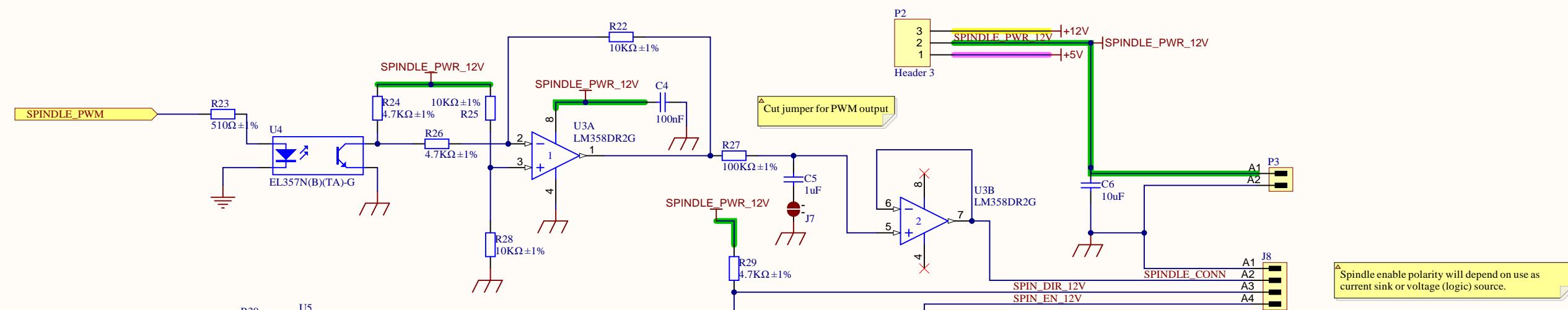
Auto direction circuit from Bryan Varner pi485 project used under MIT license. Thank you!

<https://github.com/bvarner/pi485>

SHEET		Spindle_Sync	
PROJECT	REV		
PrintNC_GRBLHAL_BreakoutPrjPCB		ENGR	DOCUMENT
AM	RS485.SchDoc		
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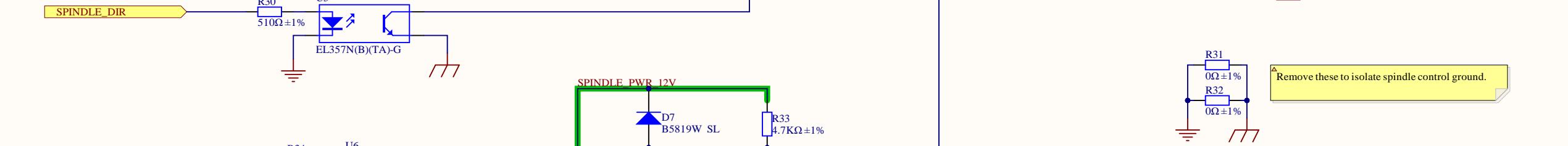
## Spindle Controls

A



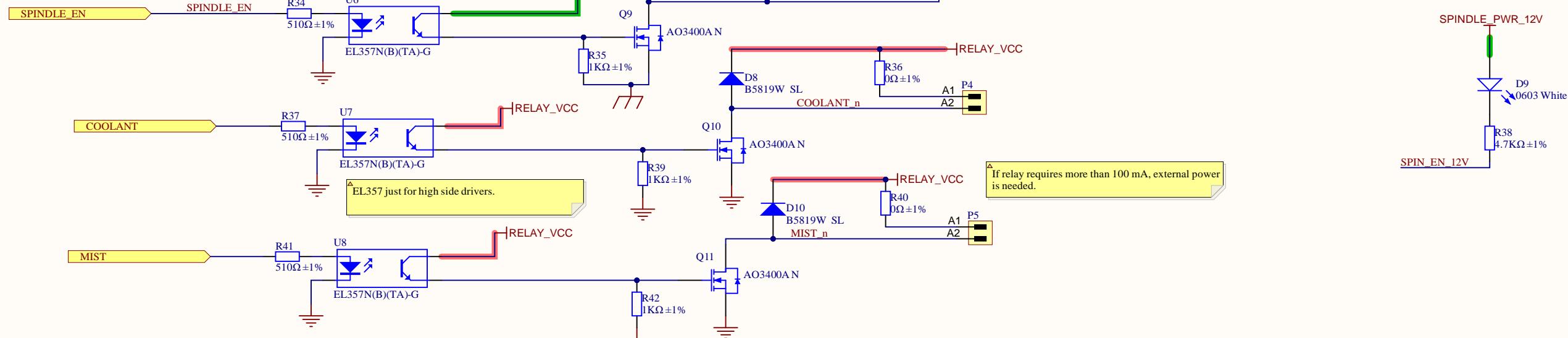
▲ Spindle enable polarity will depend on use as current sink or voltage (logic) source.

B



▲ Remove these to isolate spindle control ground.

C



▲ If relay requires more than 100 mA, external power is needed.

D



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Spindle Control	
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A

A

B

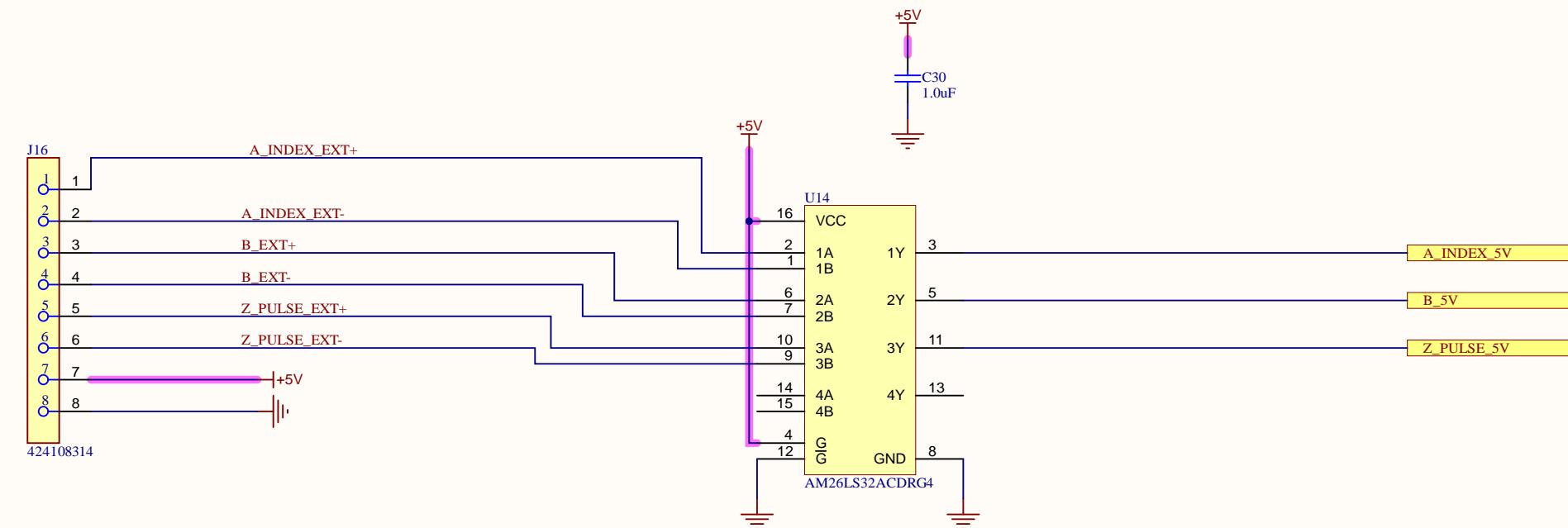
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C

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# Stepper Driver

A

A

B

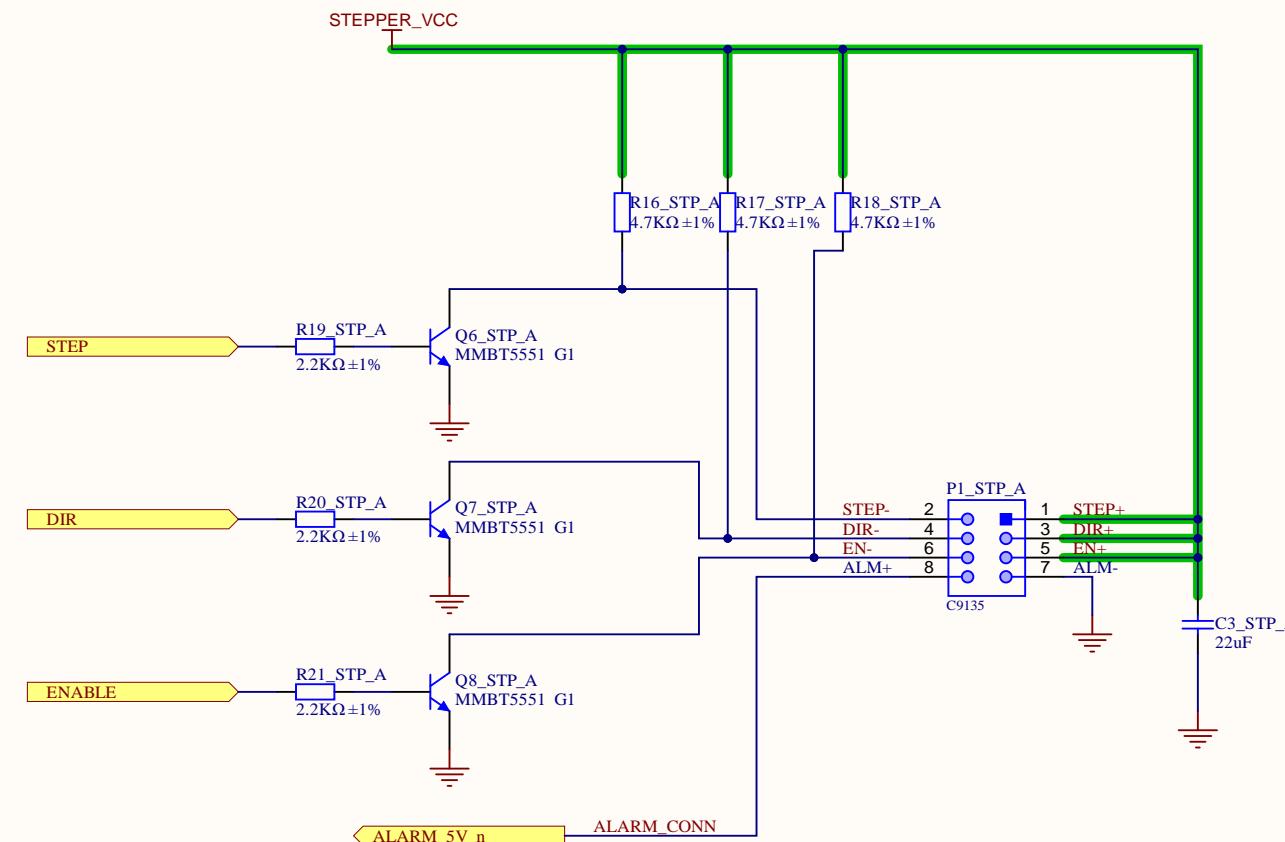
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# Stepper Driver

A

A

B

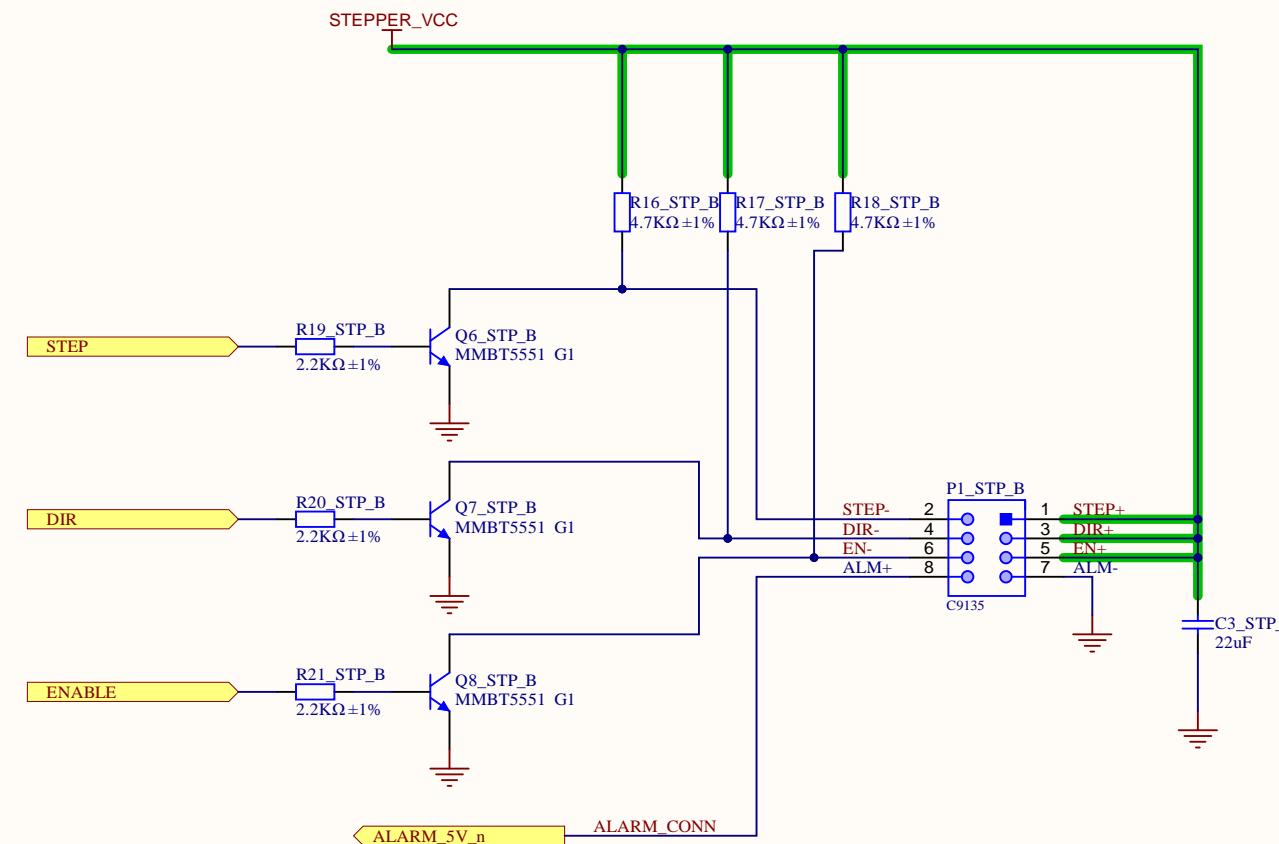
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# Stepper Driver

A

A

B

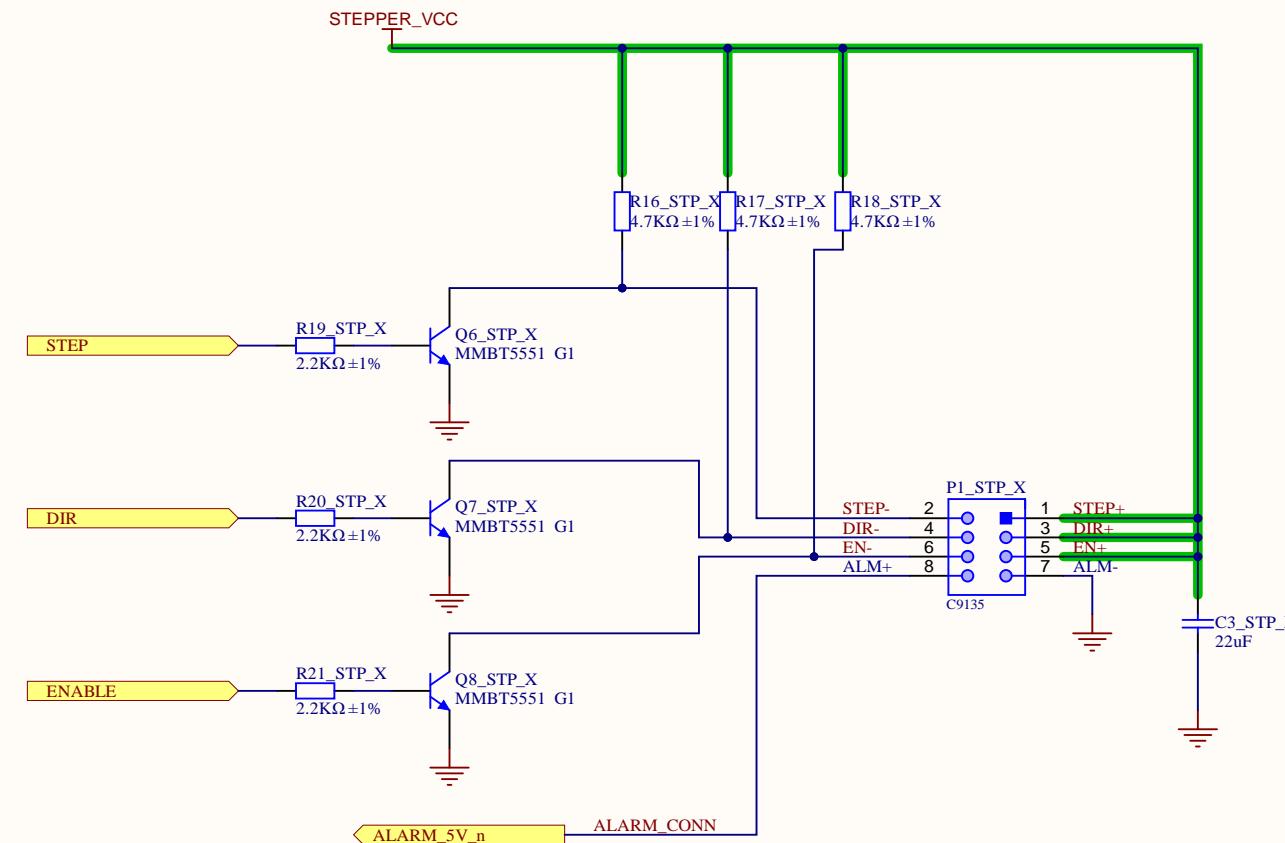
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# Stepper Driver

A

A

B

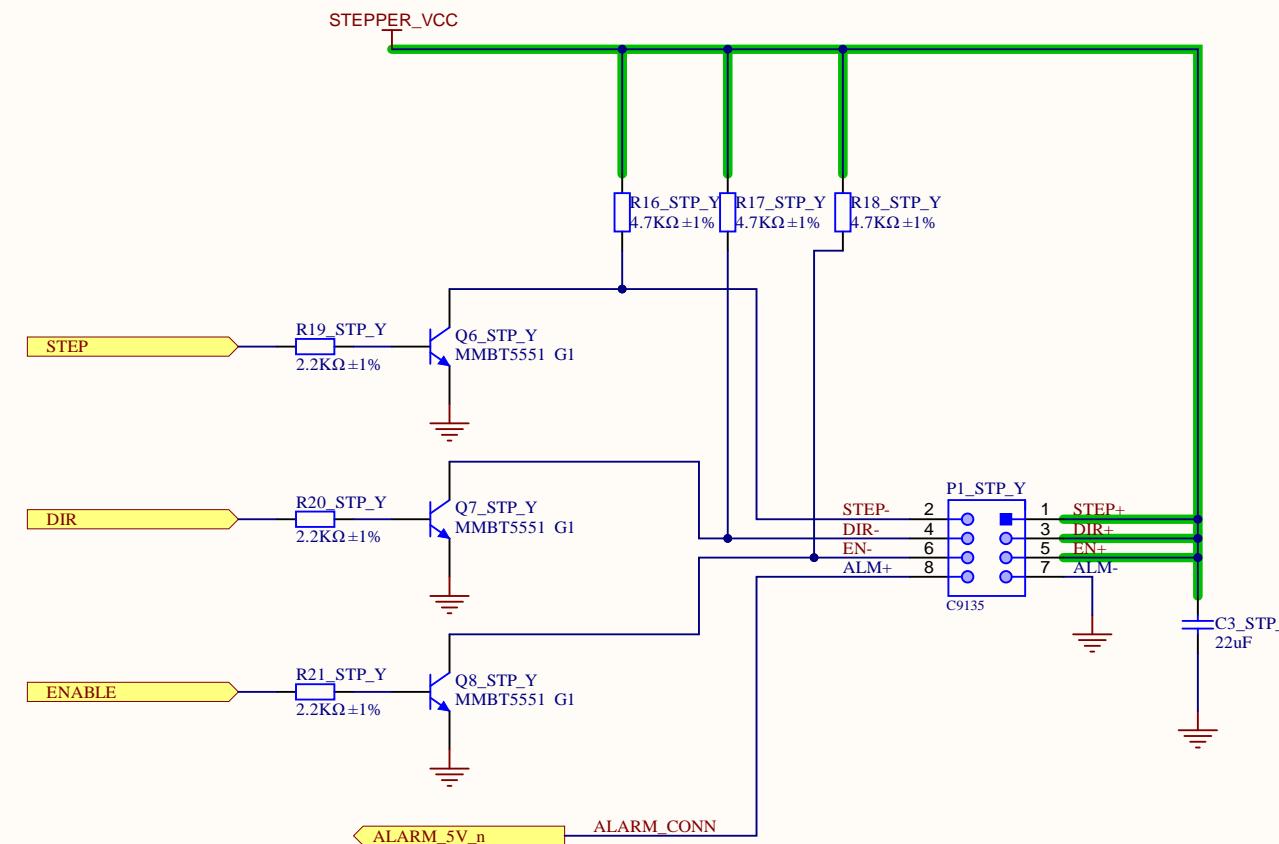
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# Stepper Driver

A

A

B

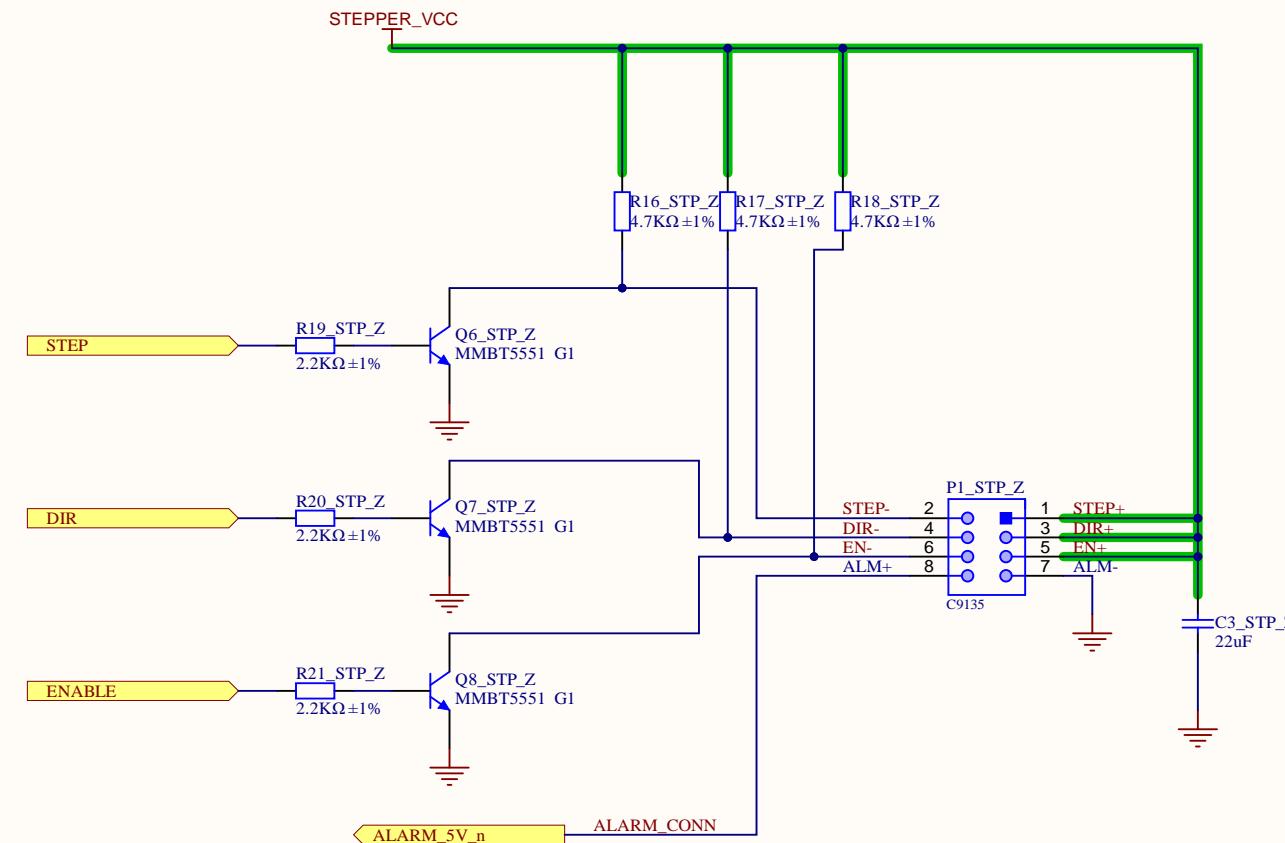
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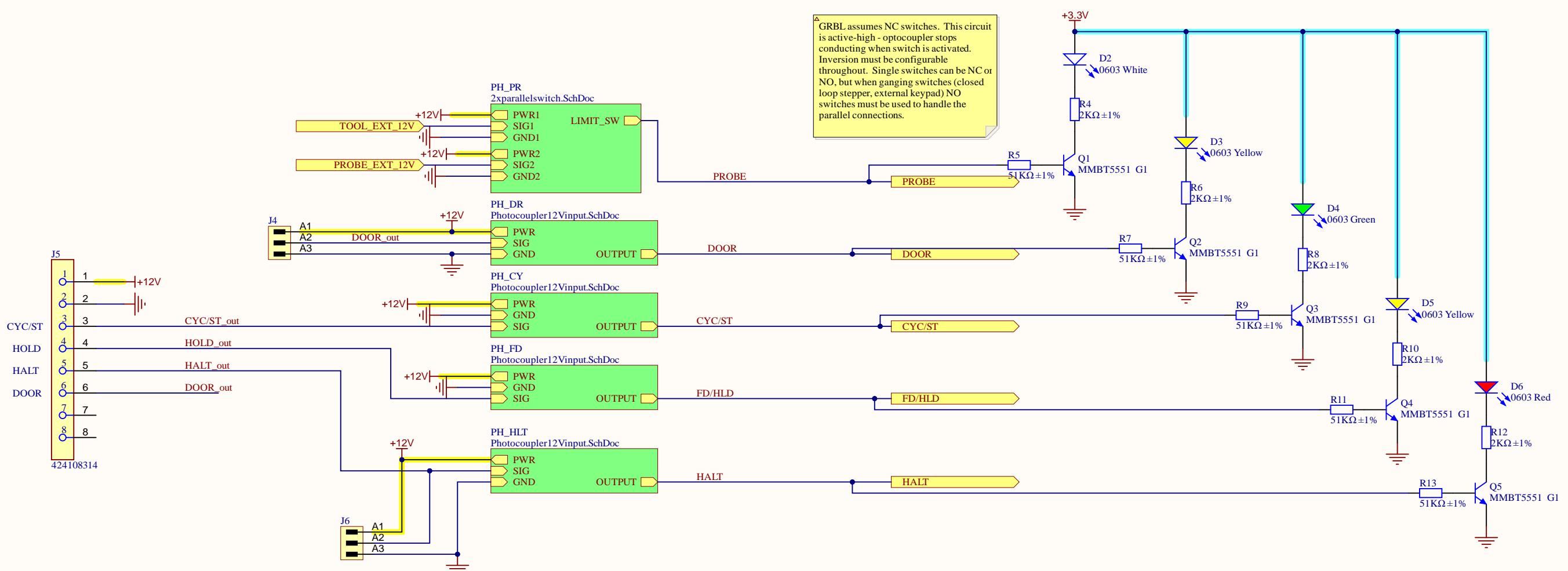
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# User Switches



# Photo Coupler 12V input

A

A

B

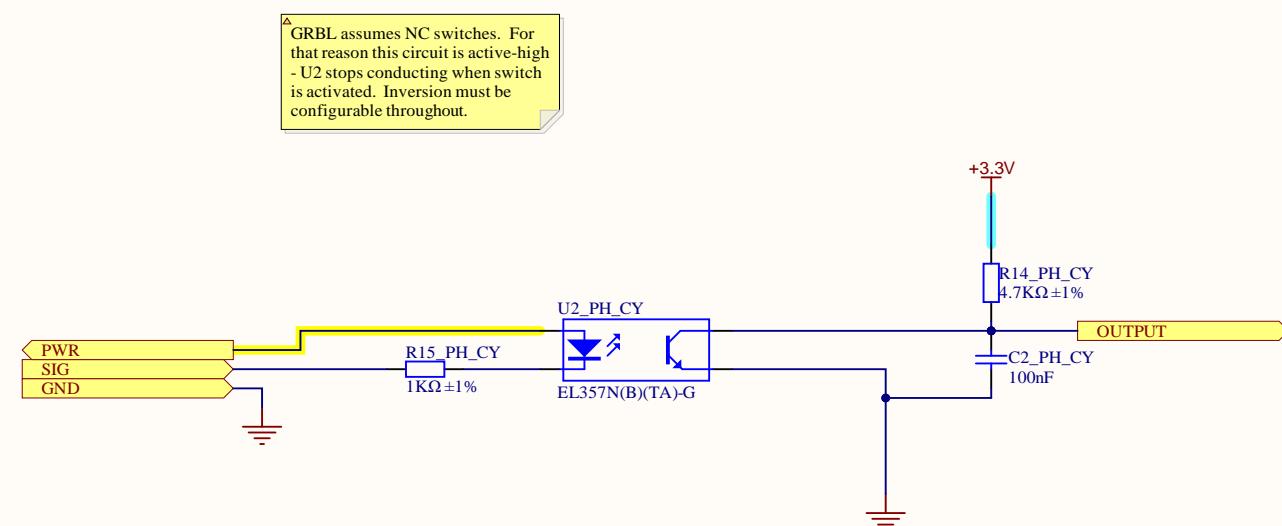
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SHEET Coupler 12V input		
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AM	Photocoupler12Vinput.SchDoc	
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# Photo Coupler 12V input

A

A

B

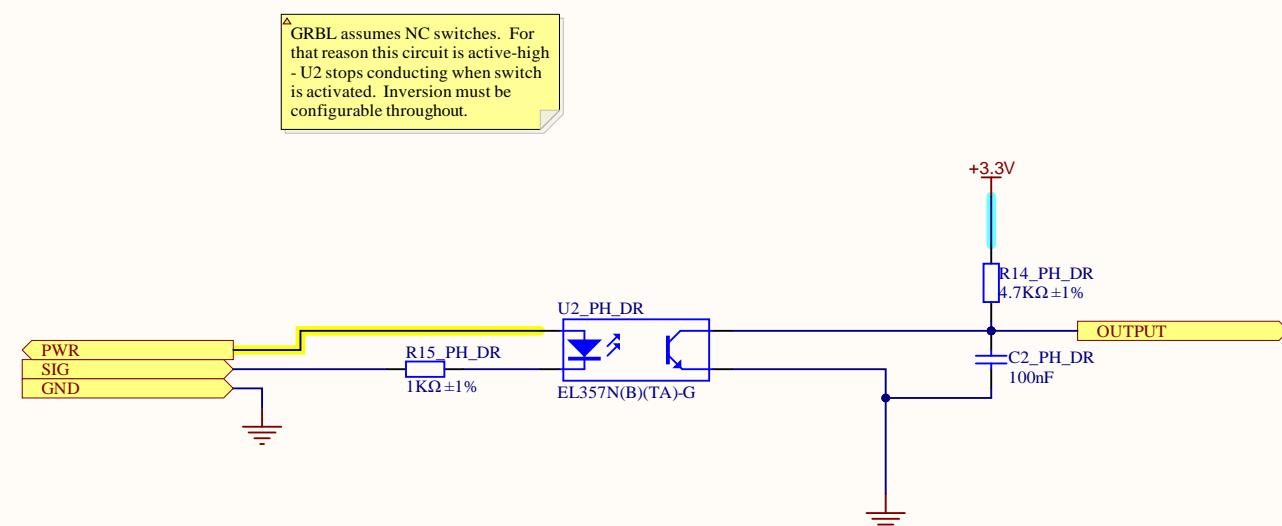
B

C

C

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D



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# Photo Coupler 12V input

A

A

B

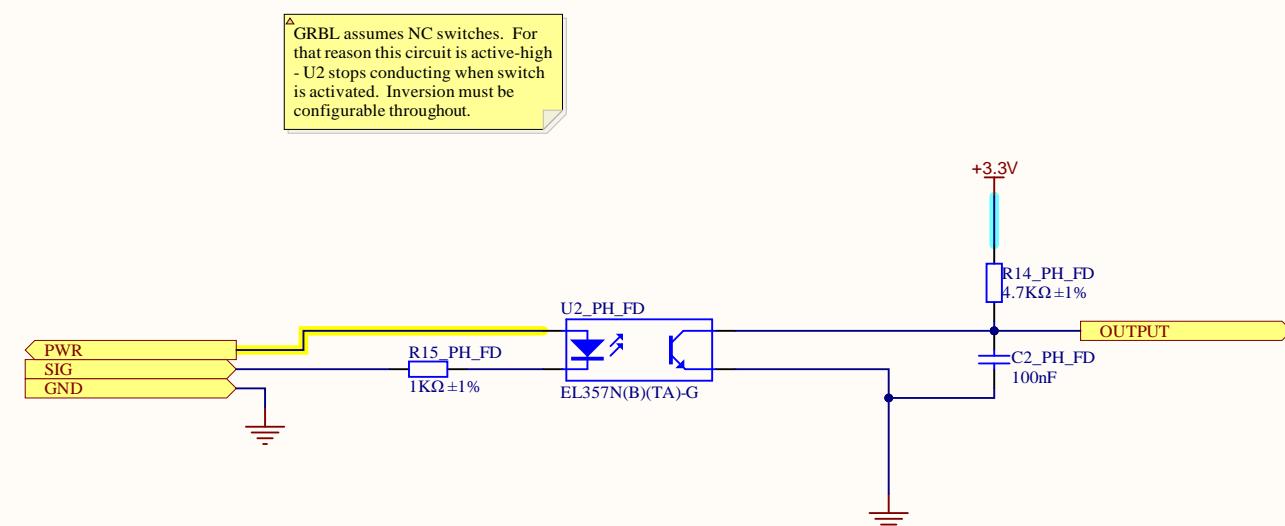
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AM	Photocoupler12Vinput.SchDoc	
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# Photo Coupler 12V input

A

A

B

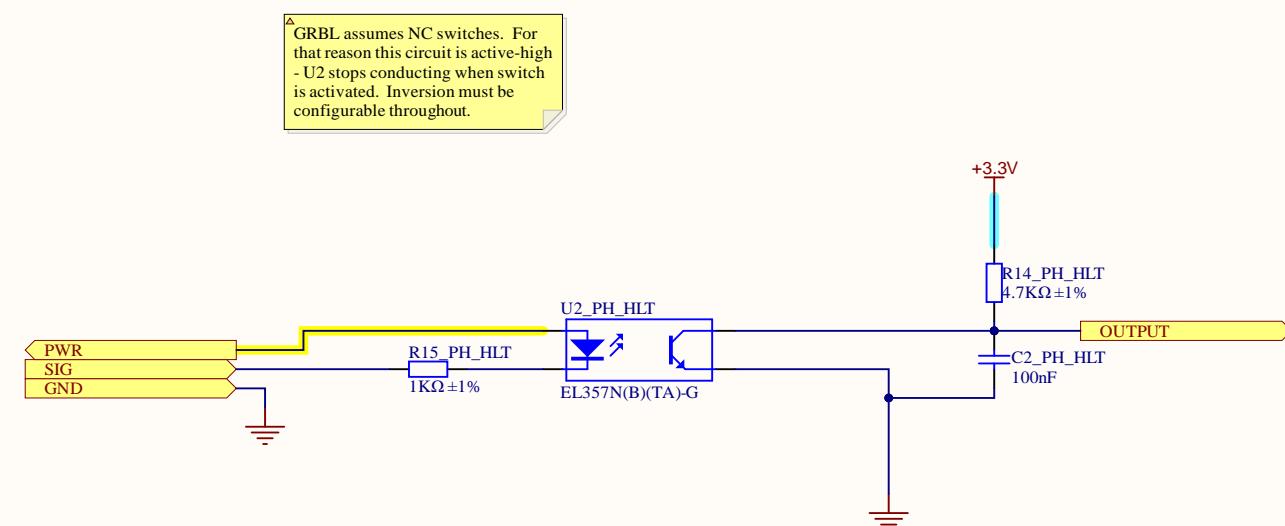
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## Change Log

Date	Revision	Description
6/08/2021	A1	Initial release of schematic.
6/16/2021	A2	Isolated 12V from relays. Added option to power relays from main input. Removed redundant 12V input Removed redundant LED Added additional 12V capacitance Replaced reverse diode with fuse and OV diode. Replaced switch diode resistors with jumpers. Updated component values Simplified closed loop controls Updated spindle control 0-10V. Removed spindle PWM for dual-amp DAC.
6/27/2021	A3	Layout updates.

Date	Revision	Description

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