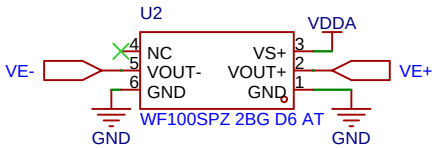
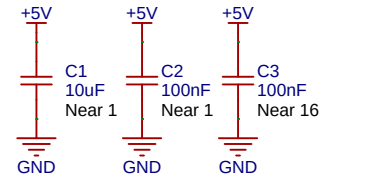
Laser Monitor
  Monitors air pressure, extractor status to keep laser safe
  Flashes warning lights, alarm if air or extractor not functioning
  Intercepts the DB9 fume control line
    Read when cut starts by extractor on signal
    Reads extractor state by fault, low pressure signals
  Air pressure transducer for air assist line
  Green-yellow-red andon setup
    GREEN: Everything OK
    YELLOW: Idle, or flashing if spooling up
    RED: Flashing, issue present

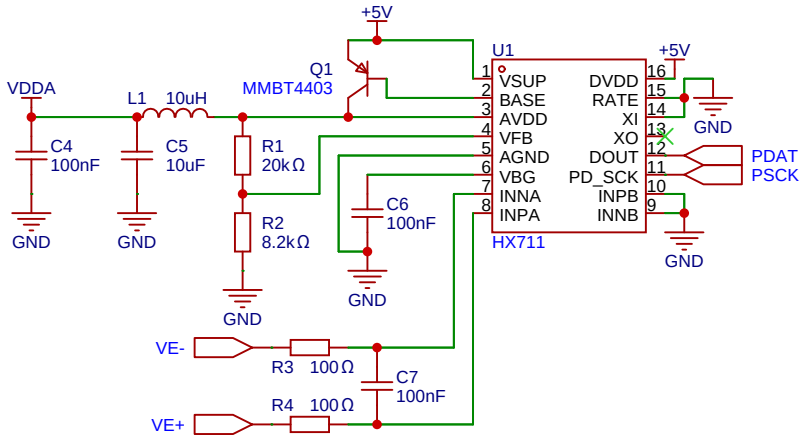
V1.0.1 Changes:
  Flipped incorrect DB9 pinout to fume extractor



2BG = 200KPA (29PSI)
Full scale output is 80mV
HX711 max input is 40mV
Equivelant to reading 0-15PSI
0 output drift is +/- 15mV

We aren't trying to measure the actual pressure, just if there is pressure present





Schematic Page	Pressure Transducer	Page Number	1
Source Link	https://github.com/rit-construct-makerspace/laser-monitor	Total Pages	6
Version	1.0.1	Laser Monitor Main Board Schematic	
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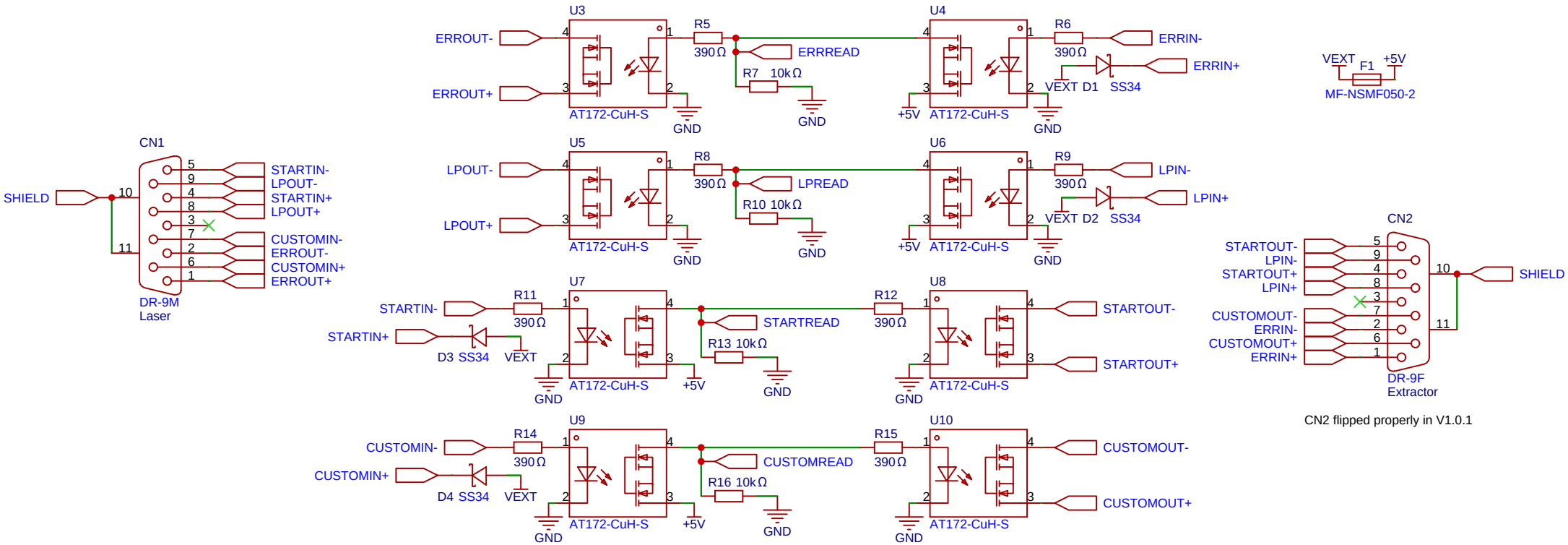
Signals are passed through independent of MCU



CN2 flipped properly in V1.0.1

https://support.epiloglaser.com/laser-machine/fusion-edge/system-requirements-setup/filter-control-connection-guide/

Pin	Signal Name	Type	Typical Usage (Varies by Configuration)
1	Input 1 (IN1+)	Input	Critical Error or "System Failure" input from filter (e.g. BOFA)
2	Input 1 Return (IN1−)	Input GND	Return for Input 1
3	N/C	Reserved	Do Not Connect
4	Output 1 (OUT1+)	Output	Start filter signal (e.g. Filtrabox / BOFA start command)
5	Output 1 Return (OUT1−)	Output GND	Return for Output 1
6	Output 2 (OUT2+)	Output	Optional/custom use output
7	Output 2 Return (OUT2−)	Output GND	Return for Output 2
8	Input 2 (IN2+)	Input	Low Pressure Detected or "Check Filter" signal (e.g. Filtrabox / BOFA)
9	Input 2 Return (IN2−)	Input GND	Return for Input 2

Schematic Page	Extractor Controls	Page Number	2
Source Link	https://github.com/rit-construct-makerspace/laser-monitor	Total Pages	6
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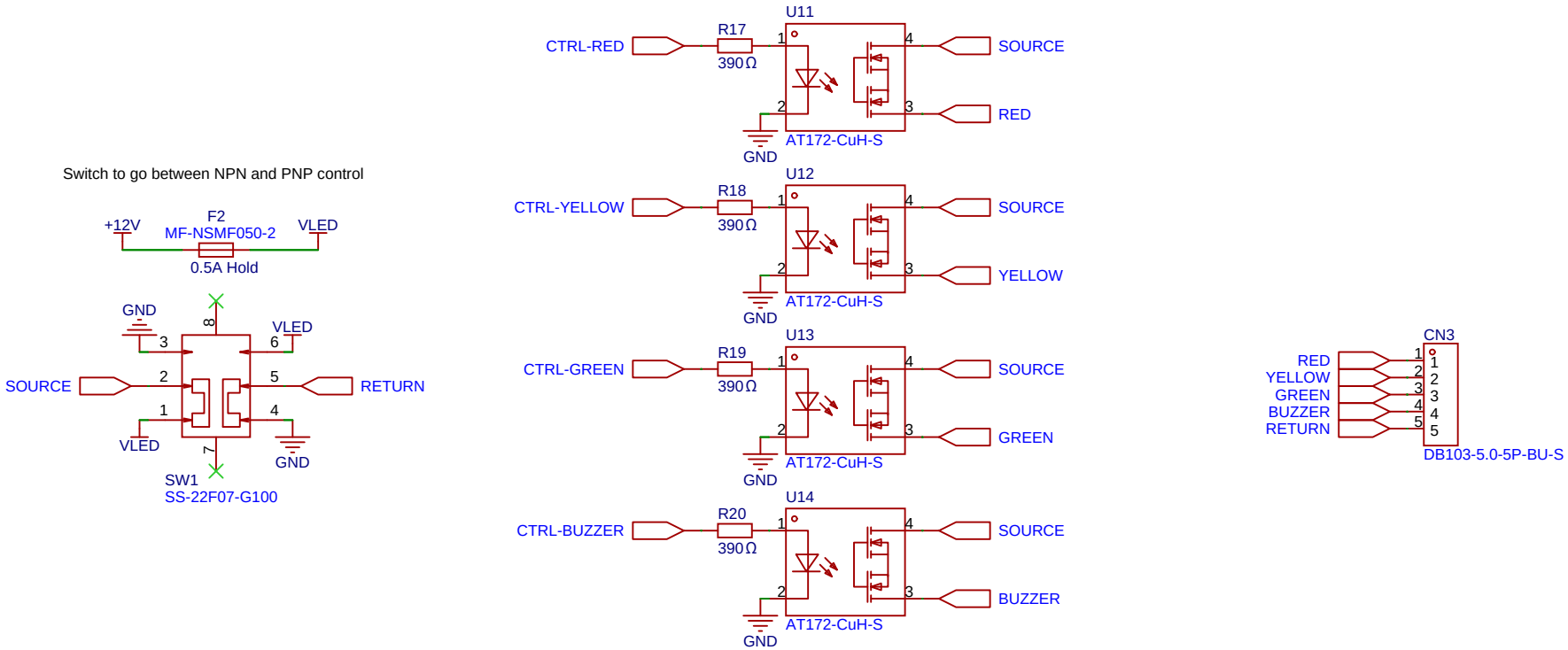
Laser Monitor
Main Board Schematic



Schematic Page	Andon Light	Page Number	3
Source Link	https://github.com/rit-construct-makerspace/laser-monitor	Total Pages	6
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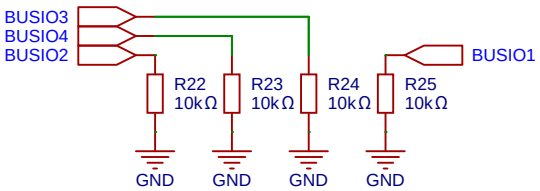
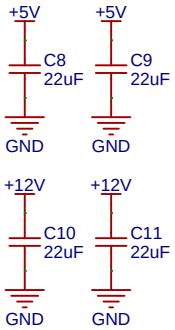
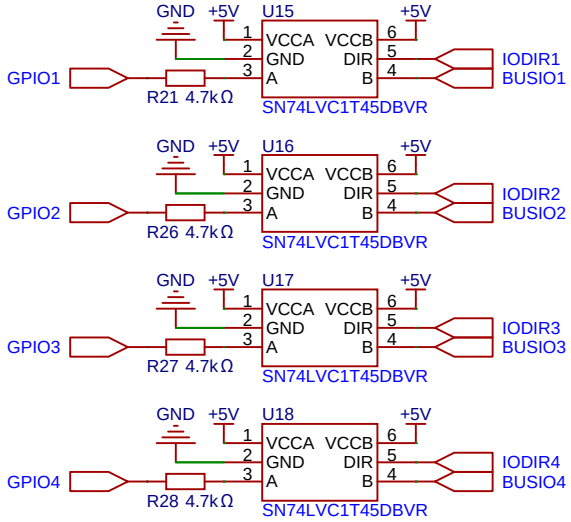
Laser Monitor
Main Board Schematic

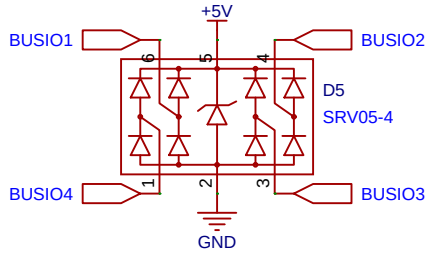
ACS Interface is optional, allows critical faults to be reported to the server.
Replaces onboard LDO with high-efficency stepdown as well



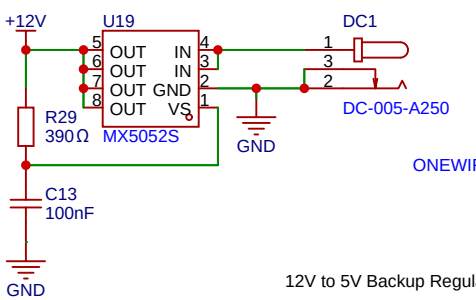


Bus GPIO Transceivers
When DIR is High, A goes to B
DIR referenced to VCCA

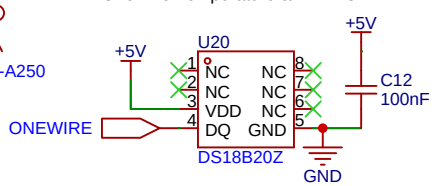


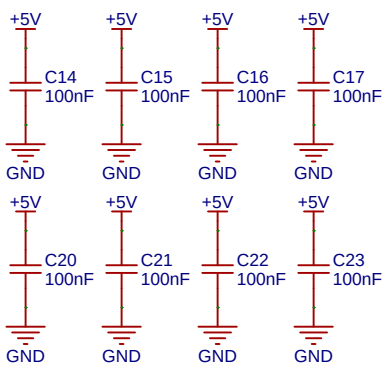


12V Barrel Jack Input

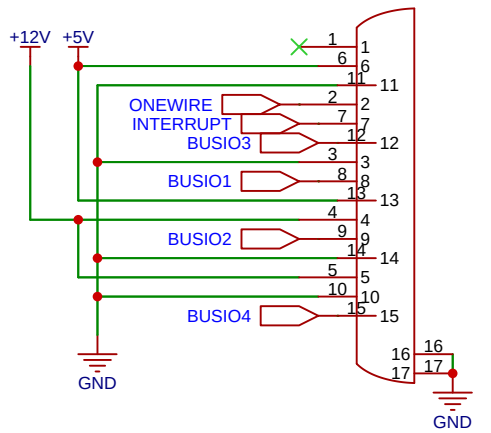


OneWire Temperature & EEPROM

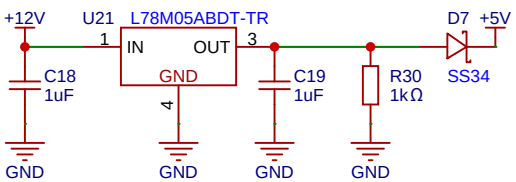


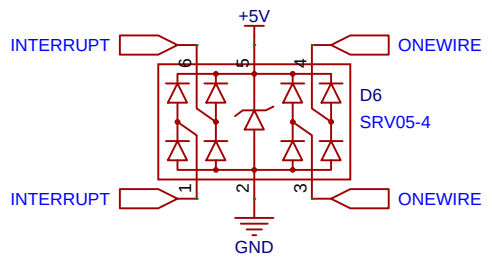


Bus 15P Connection
CN5
DS1038-15FBNSiA74-0CC

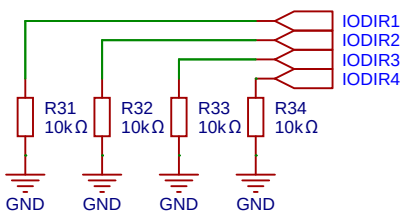


12V to 5V Backup Regulator





Default: Bus GPIO are inputs



Schematic Page	ACS Interface	Page Number	4
Source Link	https://github.com/rit-construct-makerspace/laser-monitor	Total Pages	6
Version	1.0.1		

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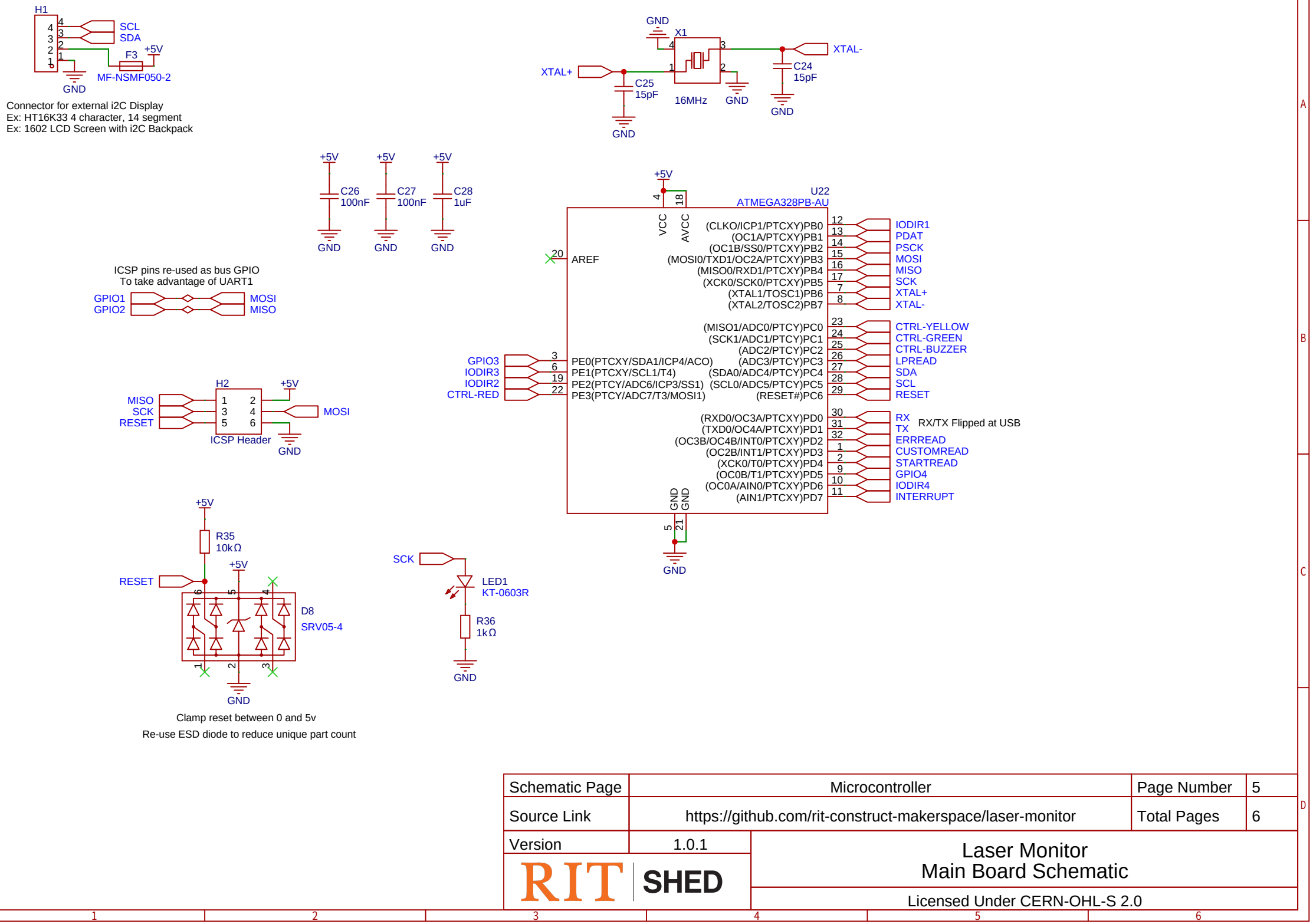
Laser Monitor
Main Board Schematic



Schematic Page	Microcontroller	Page Number	5
Source Link	https://github.com/rit-construct-makerspace/laser-monitor	Total Pages	6
Version	1.0.1		

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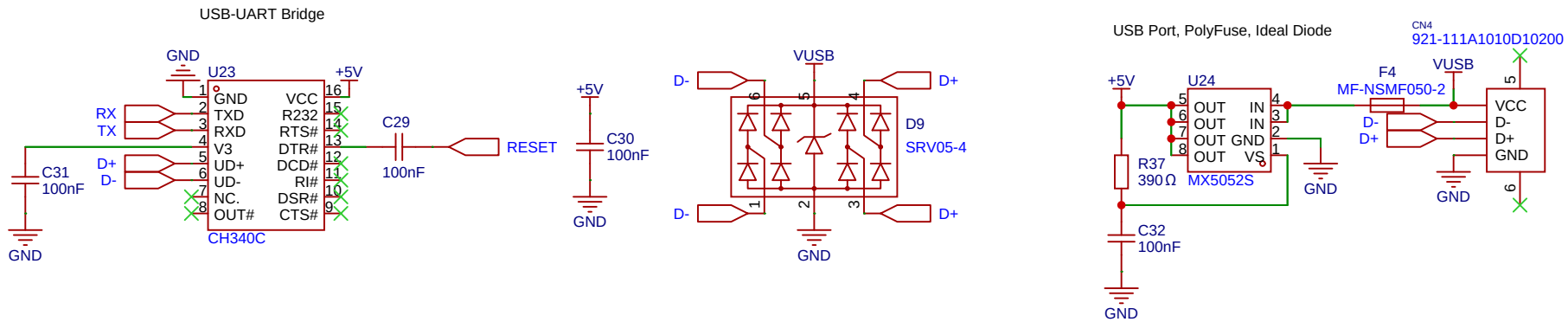
Laser Monitor
Main Board Schematic



Schematic Page	USB-UART	Page Number	6
Source Link	https://github.com/rit-construct-makerspace/laser-monitor	Total Pages	6
Version	1.0.1		

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Laser Monitor
Main Board Schematic