

Browser address bar: <https://upverter.com/documentation/>

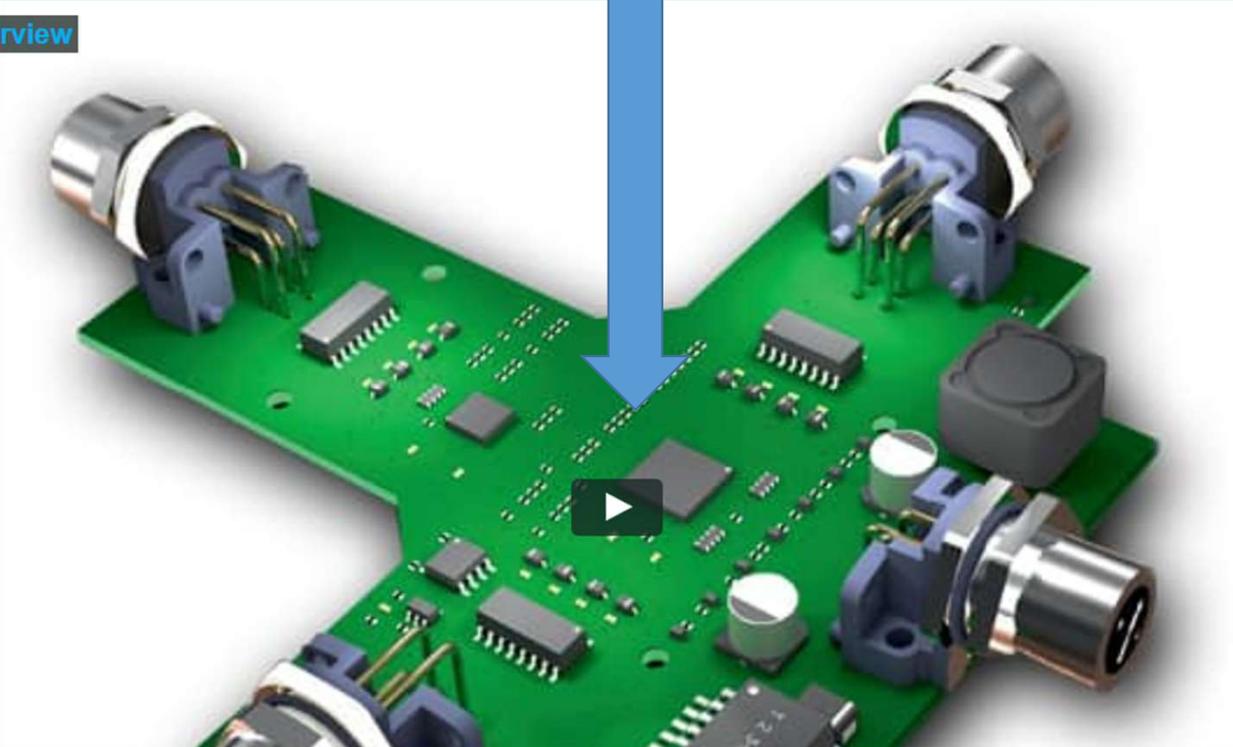
Navigation menu: Features, Solutions, Plans & Pricing, Resources, About, Contact, Log in

Header: Welcome to Upverter

Left sidebar menu: Welcome to Upverter, Getting Started with Upverter, Documentation, Change-Log

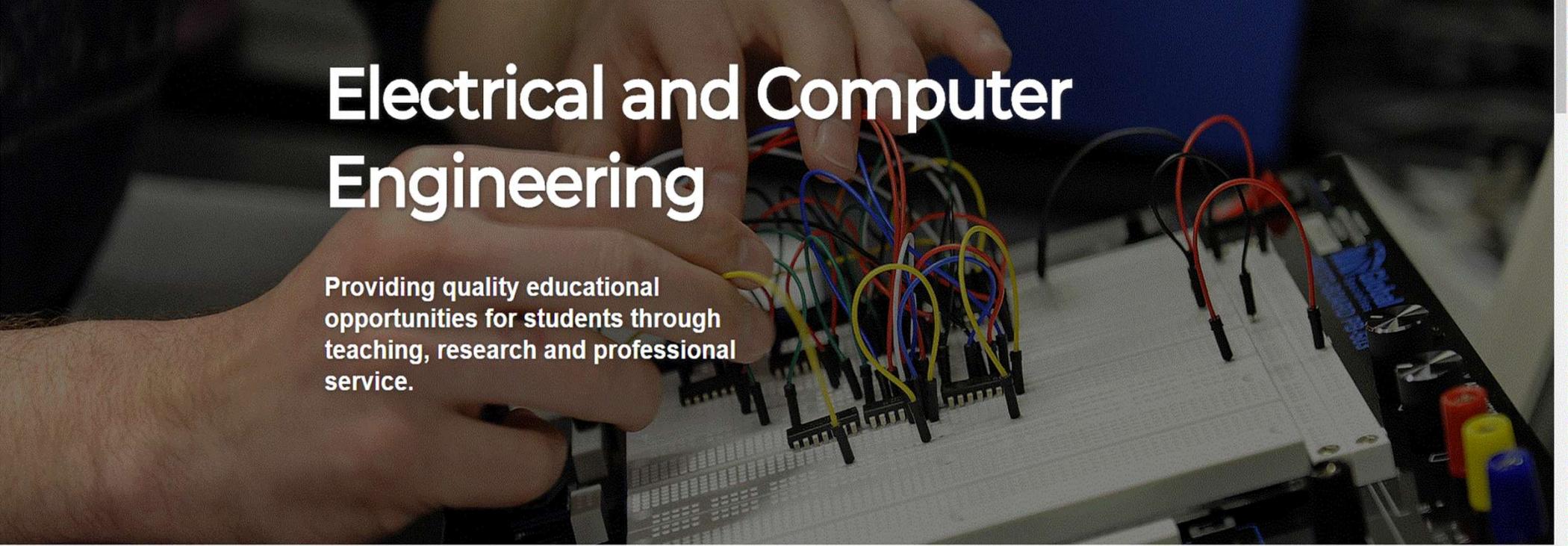
Video player title: **Upverter Overview** from Upverter

URL: <https://upverter.com/documentation>



Electrical and Computer Engineering

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Electrical and Computer Engineering

Providing quality educational opportunities for students through teaching, research and professional service.

Welcome

The Electrical and Computer Engineering Department offers high quality

Degrees Offered

We offer B.S., M.S. and Ph. D. degrees in **Electrical Engineering** and

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NDSU > [Electrical and Computer Engineering](#) > [Resources](#) > [ECE Inventory](#)

ECE Equipment Inventory

List of [ECE equipment](#) as of 3/1/2019.

ECE Parts List

List of [parts available](#) in the ECE department.

NDSU

Electrical and Computer Engineering

Phone: **(701) 231-7019**

Campus Address: **EE 101**

USPS Mailing Address: **NDSU Dept 2480, PO Box 6050, Fargo, ND 58108-6050**

Physical Address: **1411 Centennial Blvd, Fargo, ND 58102**

Page Manager: **Electrical and Computer Engineering**

Friday, March 01, 2019 4:27:41 PM

[Privacy Statement](#)

TRANSISTOR	B-1-128	2N1729	NTE100	Trans PNP, Ge, RF/IF Amp, Osc, Mx, AM	NTE
SCR	B-1-129	2N1849	NTE5507	SCR-400 VRM, 16 A	NTE
TRANSISTOR	B-1-130	2N2160	NTE6400A	Trans Unijunction, Si	NTE
TRANSISTOR	B-1-131	2N217	NTE102A	Trans PNP, Ge, AF Preamp, Dr, PD	NTE
TRANSISTOR	B-1-132	2N222A	NTE102A	[PNP] Medium Power Amplifier Germanium	NTE
TRANSISTOR	B-1-133	2N2374			
TRANSISTOR	B-1-134	2N243			
TRANSISTOR	B-1-135	2N2564			
TRANSISTOR	B-1-136	2N2635			
TRANSISTOR	B-1-137	2N2644			
TRANSISTOR	B-1-138	2N2646		Unijunction Transistor	Newark
TRANSISTOR	B-1-139	2N2806			
TRANSISTOR	B-1-140	2N2857			
TRANSISTOR	B-1-141	2N2862			
TRANSISTOR	B-1-142	2N29			
TRANSISTOR	B-1-143	2N2907		[PNP]	
TRANSISTOR	B-1-144	2N2905			
TRANSISTOR	B-1-145	2N5089			
TRANSISTOR	B-1-146	2N2944			
TRANSISTOR	B-1-147	2N3055		TRANSISTOR NPN 60V 15A TO-3	Mouser
TRANSISTOR	B-1-148	2N321			
TRANSISTOR	B-1-149	2N327A			
TRANSISTOR	B-1-150	2N3299			
TRANSISTOR	B-1-151	2N3371			
TRANSISTOR	B-1-152	2N3563			
TRANSISTOR	B-1-153	2N3643			
TRANSISTOR	B-1-154	2N3703			
TRANSISTOR	B-1-155	2N3706			
TRANSISTOR	B-1-156	2N3710			
TRANSISTOR	B-1-157	2N3711			
TRANSISTOR	B-1-158	2N3712			
TRANSISTOR	B-1-159	2N3713			
7400 SERIES	B-1-160	SN74LS595N		IC 8BIT SHFT REG OUT LATCH 160IP	
	B-1-161	MCP4162-103	4162103	SINGL 78 NV SPI Rho MICRO DIGITAL POTENTIOMETER ics	
TRANSISTOR	B-1-162	2N3789			
TRANSISTOR	B-1-164	2N3820			
TRANSISTOR	B-1-165	2N3826			
TRANSISTOR	B-1-166	2N963			
TRANSISTOR	B-1-167	2N964			
TRANSISTOR	B-1-168	2N967			
TRANSISTOR	B-1-168A	FGPN60LS		IGBT- Insulated Gate Bipolar Transistor 600V	Newark
TRANSISTOR	B-1-169	2N3827			
TRANSISTOR	B-1-170	2N3839			
TRANSISTOR	B-1-171	2N3904		2N2222AP Trans NPN SS GP 200mA TO-92 Package	Digi-Key
TRANSISTOR	B-1-172	2N3906	2N222	TRAN PNP SS GP 200mA TO-92	Digi-Key
TRANSISTOR	B-1-173	2N3913			
TRANSISTOR	B-1-174	2N404			
TRANSISTOR	B-1-175	2N4060			
TRANSISTOR	B-1-176	2N408	SK3004	T-PNP, Ge, AF Preamp, Dr, PD	
TRANSISTOR	B-1-177	2N4120			
TRANSISTOR	B-1-178	2N428			
TRANSISTOR	B-1-179	2N4126			
TRANSISTOR	B-1-180	2N5060			
OP-AMP	B-2-001	OPA4251PA		IC Quad Micro Power Op Amp, 15 V	Mouser
OP-AMP	B-2-002	LM833N		Dual Audio Op Amp, 15 MHz BW	Digi-Key
MULTIPLEXER	B-2-003	MAX396EPI		[CMOS Analog Multiplex, Low-V, Dual 8 Ch	
SENSOR	B-2-004	QT60040-IS		SENSOR IC MATRX TOUCH 4CH 1450IC	Digi-Key
OP-AMP	B-2-005	CLC428		Op Amp, Dual Wideband/ Low-Noise/ Voltage Feedback	
SENSOR	B-2-006	TQ1		Sensor Touch Charge Transfer	



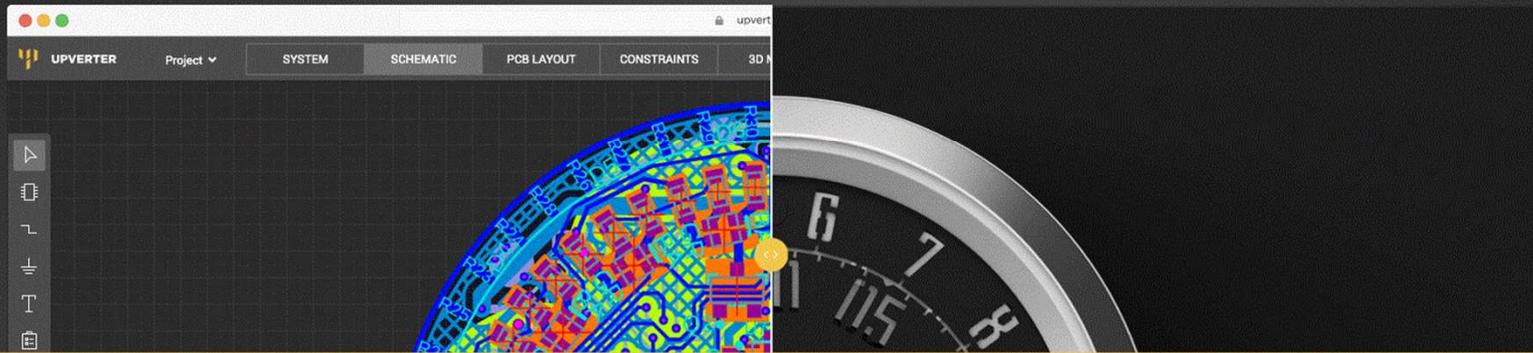


Sign In

Electronics Design for Anyone and Everyone

Meet Upverter, the Free, easy-to-use electronic design tool that helps you bring your unique hardware ideas to life, no matter your engineering knowledge.

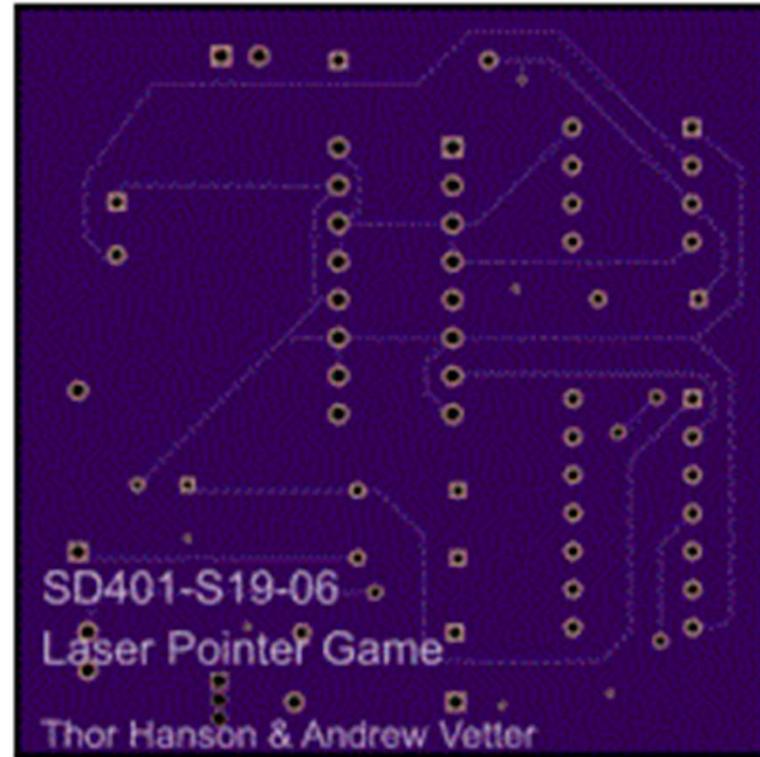
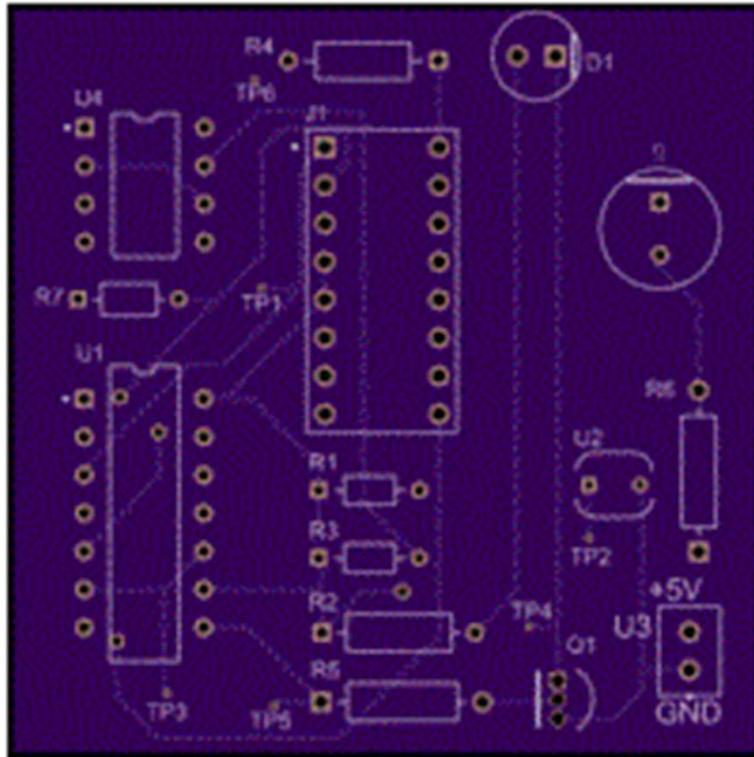
Sign Up For Free



Start Designing Your Electronics Online with Speed and Ease

Start from scratch, upload an existing design, or choose from thousands of community designs to customize any way you want.

UPVERTER .ppt



By using Upverter you will create gerbers , gerber files are used to create pcb's. This is a typical pcb.

Why use Upverter?

In the near future you may or may not be using Upverter.

There are many PCB generating programs available. It all depends on the application.

For Schematic Design and PCB Design, you may choose Multi-Sim (very good program and is heavily used by Engineers, It is also expensive and has a large learning curve.

Digi-key has pcbartist, there is ki-cad, design-spark and many more.

Upverter.com was chosen as it is web-based, its free, and has an easier learning curve than others, plus it has a collaboration option that works quite well when you team-up on a project.

UPVERTER

Power Point to aid in the creation of a PCB

Slides 1-12 Upverter Information

 Slides 13-24 Create the Schematic

Slides 25-41 Create the PCB 

Slides 42-50 Create the Gerber's

Slides 51-53 On line Gerber-Viewer

Slides 57-60 Order Procedures from Osh Park

 Slides 61-67 For a more advanced PCB using Arduino Atmega328P

Upverter is web based

go to upverter.com, and Sign up. Username is email, password and then maybe collaborate after you pick a partner

- Create your own account, password protected

Collaboration is possible. This makes it easy to work on a project together

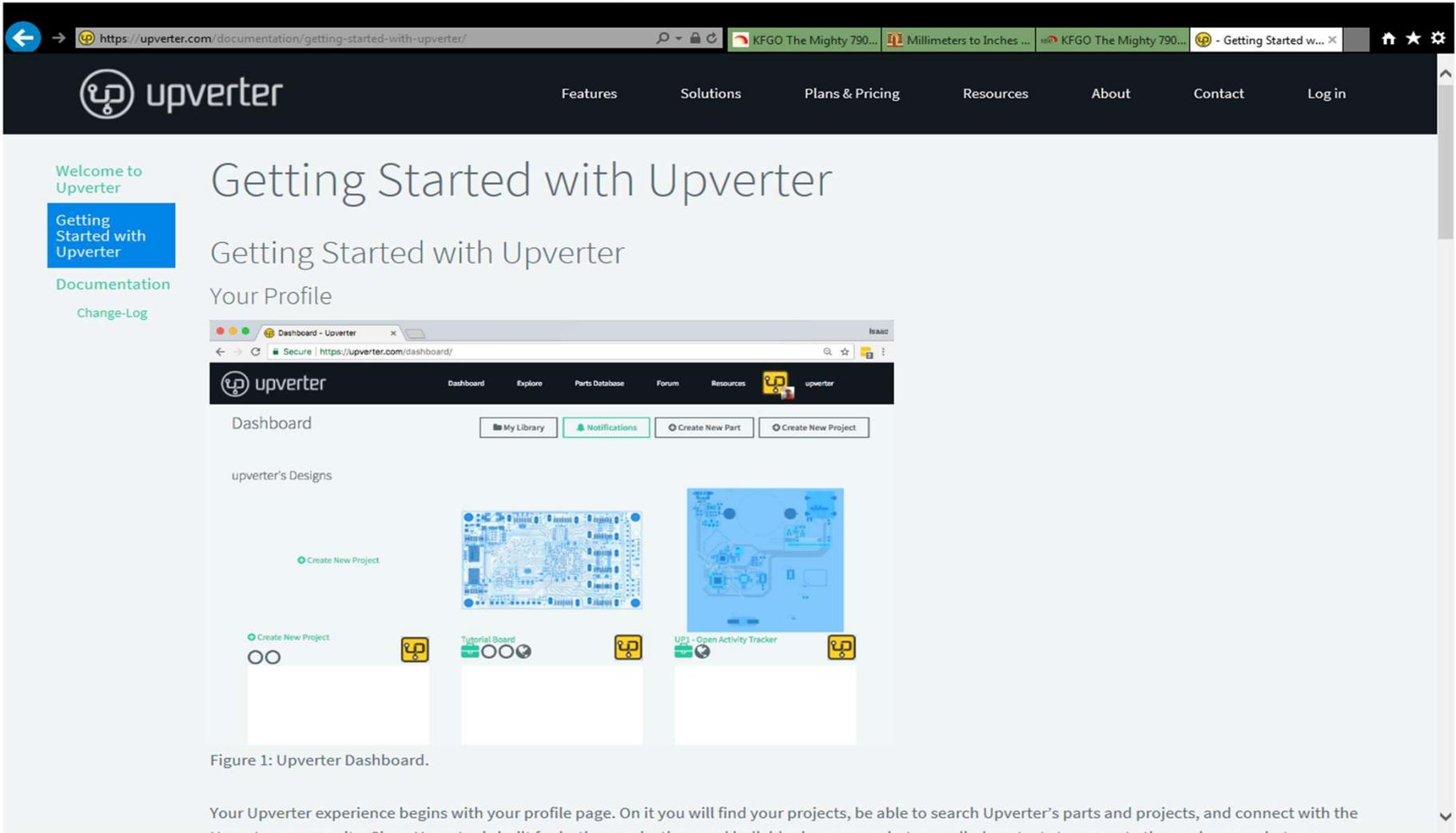
Some problems- it is web based- Upverter does not like Internet Explorer, works ok with Mozilla, but seems to work best with **Google Chrome**

Also you can collaborate with different log-ins but you cannot be logged in to two different computers at the same time with the same log-in ID and password.(It doesn't like collaborating with itself).

<https://www.youtube.com/watch?v=QZbE-gGRtD4>

This was very a useful website for getting started There is a Part 1 for making the schematic and Part 2 for making the PCB If you take the twenty minutes and work through it, you will find it rewarding

After an account has been created, this is what you will see.



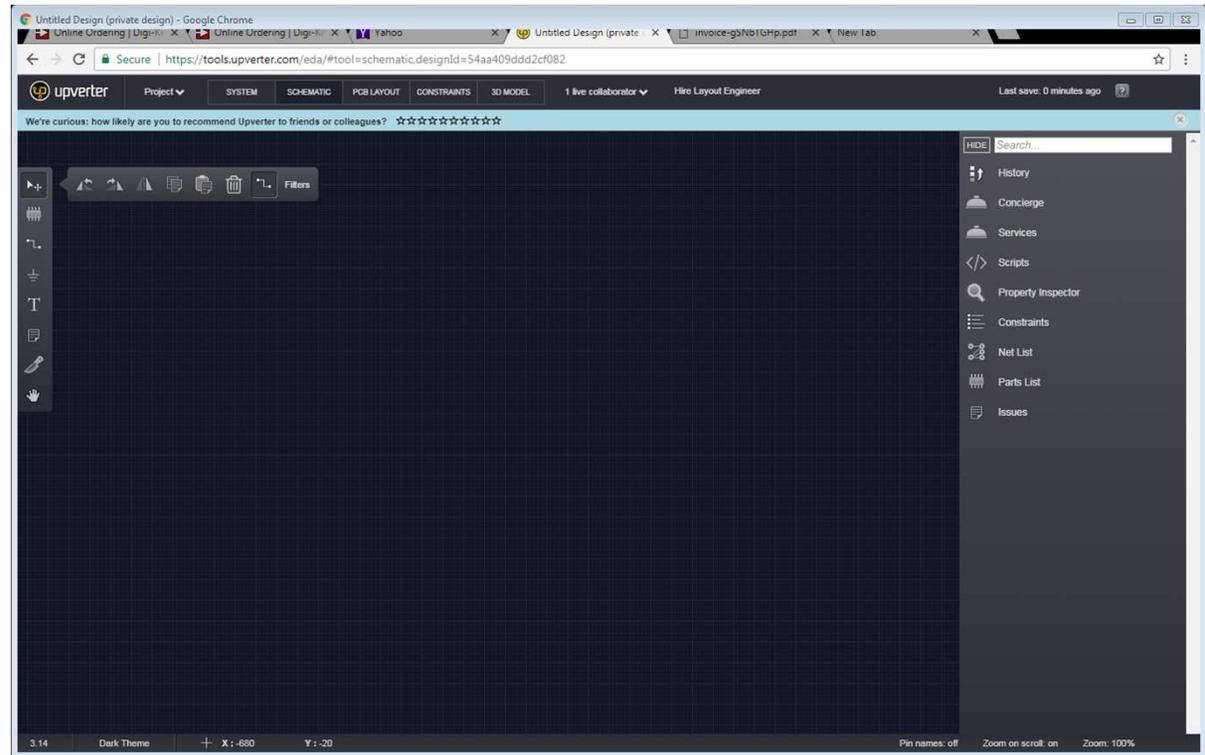
After going to Upverter.com and creating an account

Create a New Project

- Create a New project

>Project

> New



NDSU Employment Op x Yahoo - login x Yahoo x yahoo.com - Polarity Yo x New Tab Search x Microsoft PowerPoint x Microsoft PowerPoint x 555 timer (private desig x Upverter User Manual x

docs.google.com/document/d/1rw9T5aFdXkz1TaKuxiM3JfbQH5I-BDWSpvFbdEyPINc/edit

Upverter User Manual Rev A
File Edit View Insert Format Tools Add-ons Help

100% Normal text Arial 11 B I U A

Outline

- Mission
- Manifesto
- Welcome to Upverter
- Getting Started with Upverter
- Your Dashboard
 - Project Editor
 - How to Fork/Copy an Existin...
 - How to Delete a Project
 - System Designer
 - Select & Move
 - Rotate Left
 - Rotate Right
 - Flip
 - Delete
 - Auto net routing
 - Block
 - System Designer Block Types
 - General
 - Sensors/Input



upverter

User Manual
Revision A

Format page: left margin

Juan Cruz Becerra
Aug 26, 2018
Format: indent first line

Юра Александров
Jan 31, 2019
Format page: right margin

Tim Gillespie
Jun 24, 2019
Add: " "

Jason Hastings
Jul 25, 2019
Format list: add to list
Format: indent first line, indent left

jamie schnaitt...
12:59 PM Sep 1
I feel like a Wiki would be a better way to do this
Reply...

Srini Vasam
Jun 7, 2018
Delete paragraph
Add paragraph

User Manual is very handy and easy to get at, open from Lower Left corner of page

Adding Parts to the schematic. Verified vs. Generic

The screenshot shows a web browser window with the URL <https://tools.upverter.com/eda/#tool=schematic.designId=54aa409ddd2cf082>. The main content is an "Add Component" dialog box. On the left, there is a sidebar with a tree view of component libraries: "components", "modules", "generics", "in-design", and "jeffrey.erickson's library". The "components" library is selected. Below the sidebar is a "Load More" button. The main area of the dialog shows a search result for "components" with 1371853 results found. At the top right of the results area are two buttons: "Request Symbol and Footprint" and "Create New Part Manually". Below these is a table with the following columns: Value, Description, Package, and Type. The table lists several generic components, each with a schematic symbol, a "Place Component" button, a file icon, and a star icon.

Value	Description	Package	Type
5K	Generic Resistor		resistor
10uF	Generic Capacitor (Non-Polarized)		capacitor
	Generic Battery		battery
	Generic Voltage Source		integrated circuit
	Generic LED		diode
10uF	Generic Capacitor (Polarized)		capacitor
	Generic Diode		diode
	Generic General Switch		integrated circuit

555 timer (private design) - Google Chrome

Secure | <https://tools.upverter.com/eda/#tool=schematic.designId=39427c86f5328698>

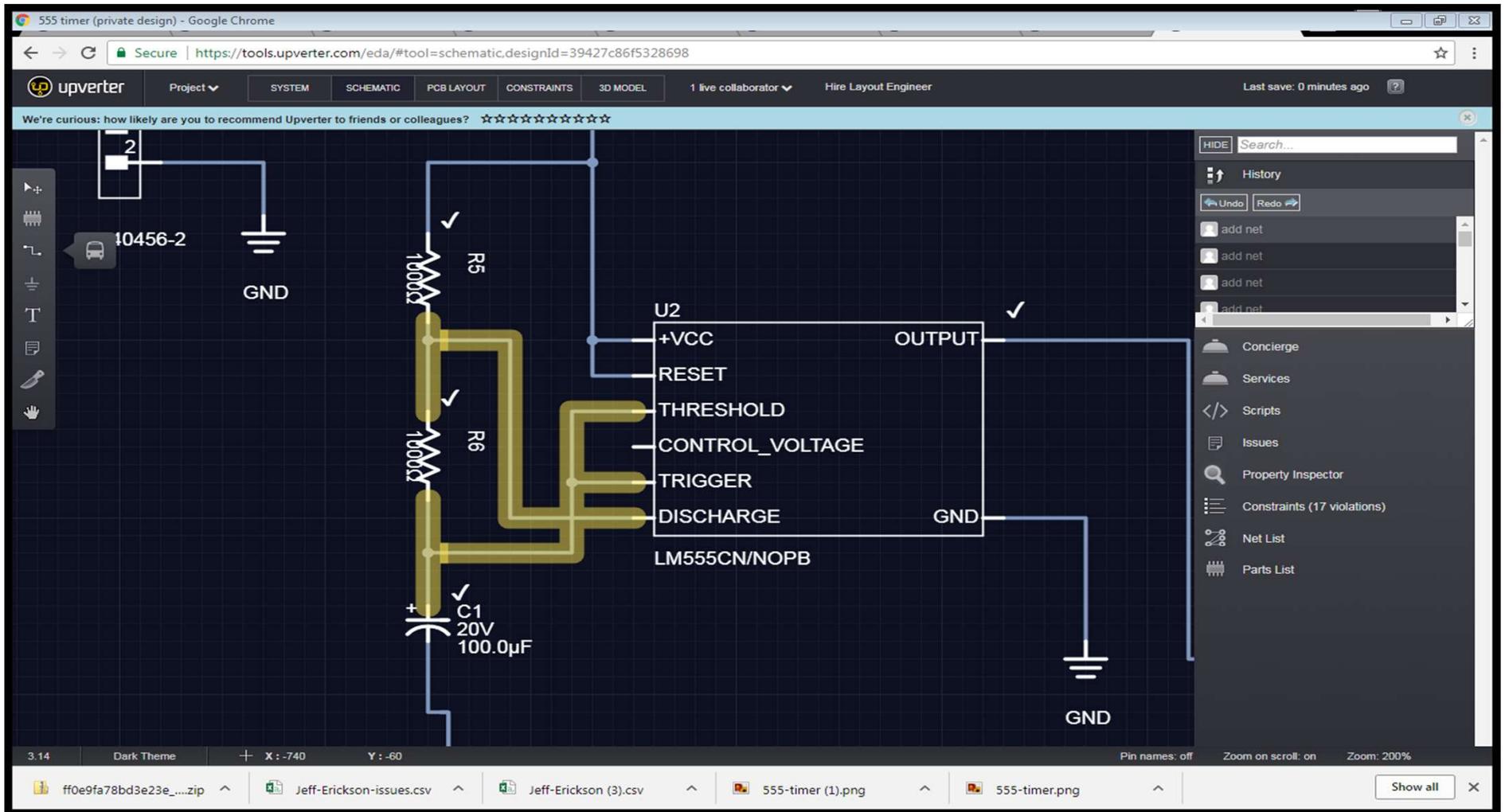
upverter Project SYSTEM SCHEMATIC PCB LAYOUT CONSTRAINTS 3D MODEL 1 live collaborator Hire Layout Engineer Last save: 0 minutes ago

We're curious: how likely are you to recommend Upverter to friends or colleagues? ☆☆☆☆☆☆☆☆

3.14 Dark Theme X: -890 Y: -40 Pin names: off Zoom on scroll: on Zoom: 100%

ff0e9fa78bd3e23e_...zip Jeff-Erickson-issues.csv Jeff-Erickson (3).csv 555-timer (1).png 555-timer.png Show all

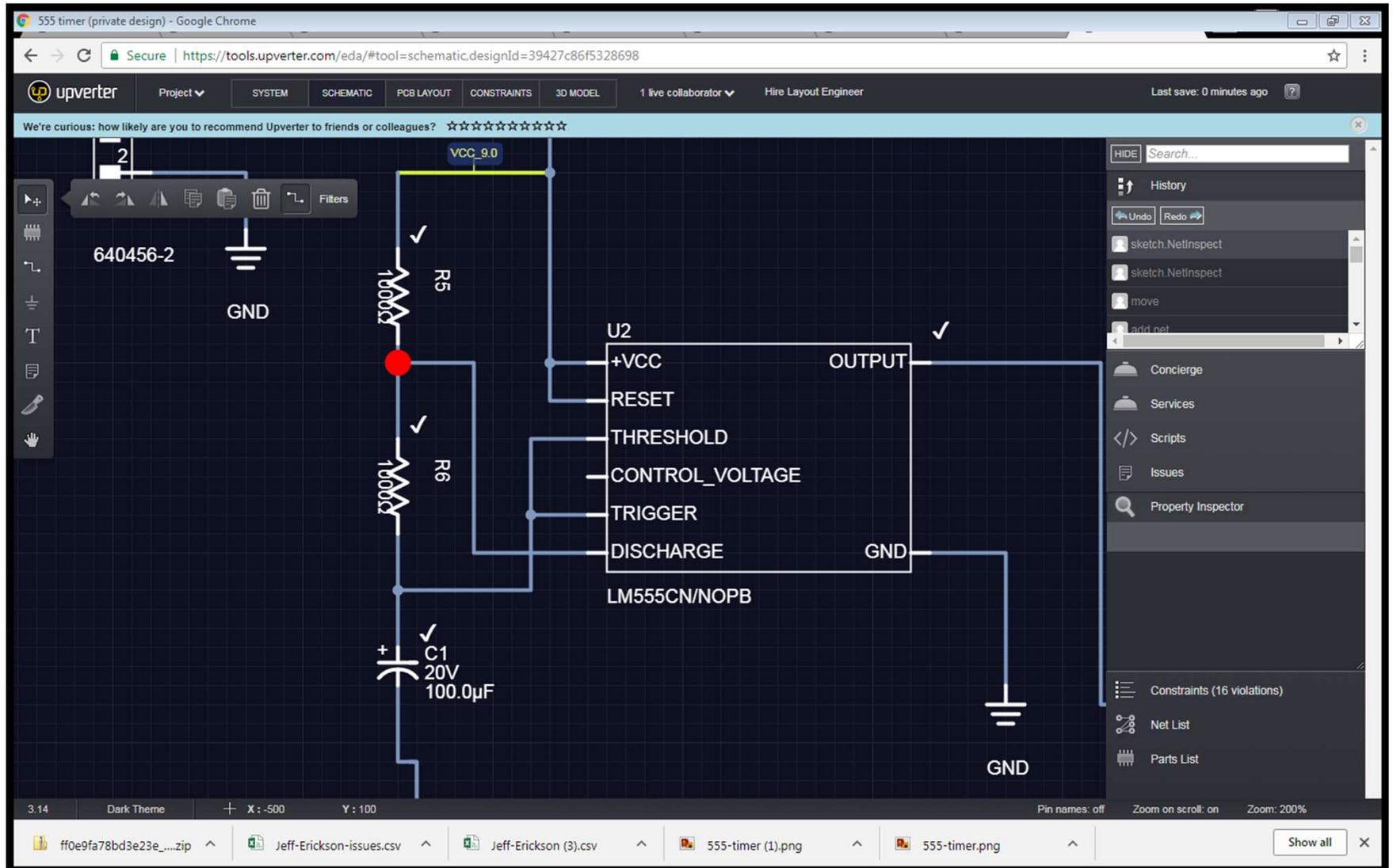
When creating schematic, do you have any issues like this? (Highlighted in Gold?)



Nets have to be named. Double click on the gold, this box shows up, and name your NET

The screenshot displays the Upverter web-based schematic editor interface. A circuit diagram is shown with a gold-colored net selected. A 'Net Inspector' dialog box is open, allowing the user to name the net and view its terminals. The net name is '(C1 - 2) (R6 - 2) (U2 - 2) (U2 - 6)'. The terminals are 'C1 - ANODE', 'R6 - 2', 'U2 - THRESHOLD', and 'U2 - TRIGGER'. The 'Save' button is highlighted. The background schematic includes a power source '640456-2', resistors 'R5' and 'R6', a capacitor 'C1' (20V, 100.0µF), and a ground symbol 'GND'. The interface also shows a top navigation bar, a left toolbar, and a right sidebar with various tool panels.

Gold outline is now gone and circuit is finished- time to convert the Schematic into a CAM File



I started with a Microcontroller- using the Arduino ATmega328-PU IC, which is a 28 Pin DIP Package IC

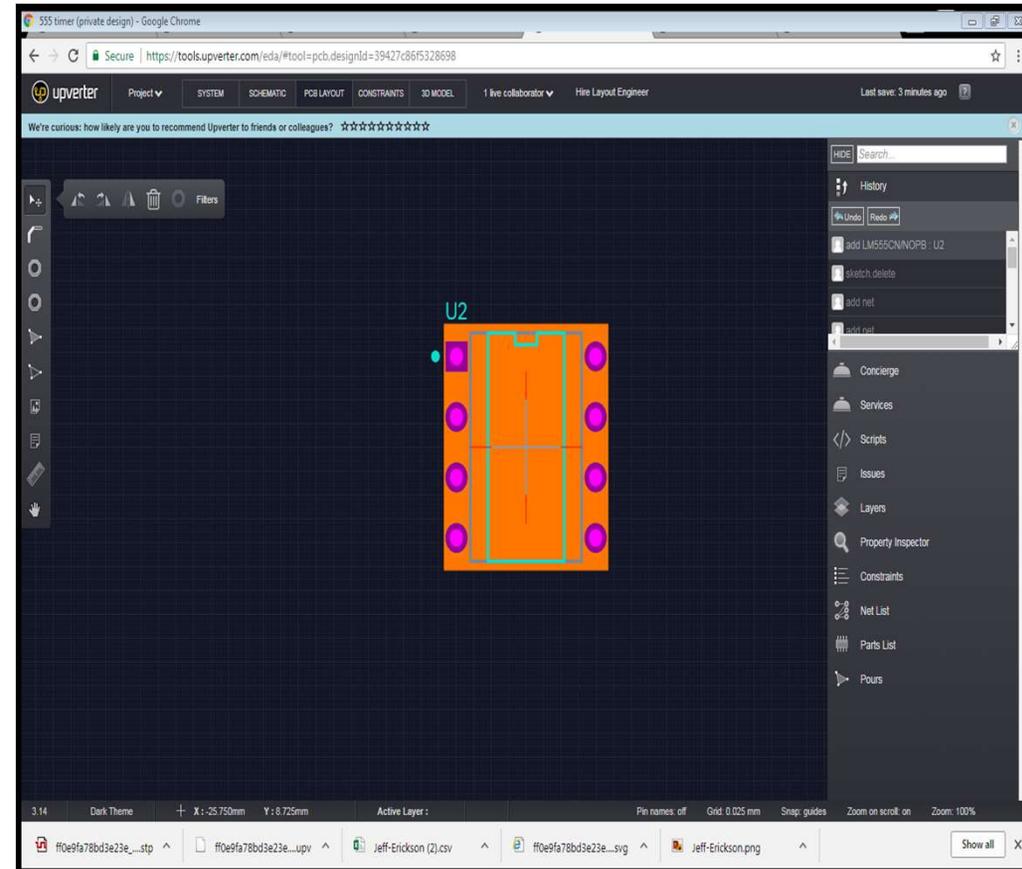
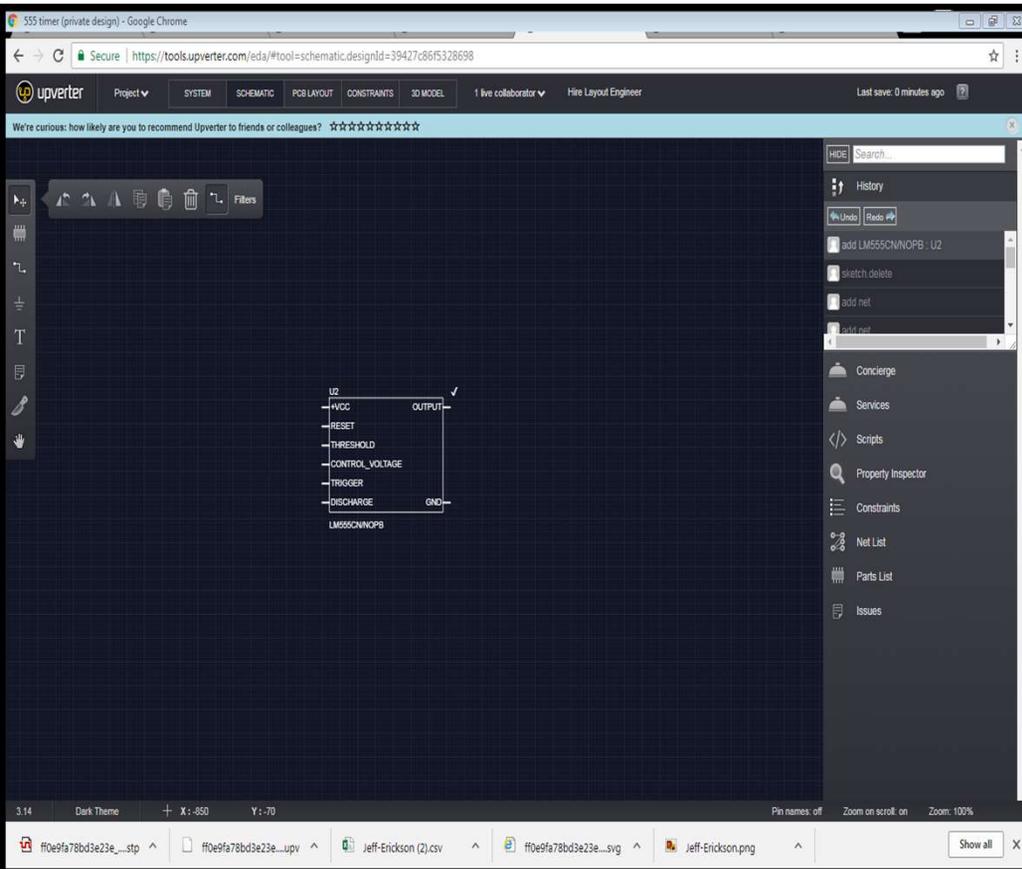
41 result(s) found.

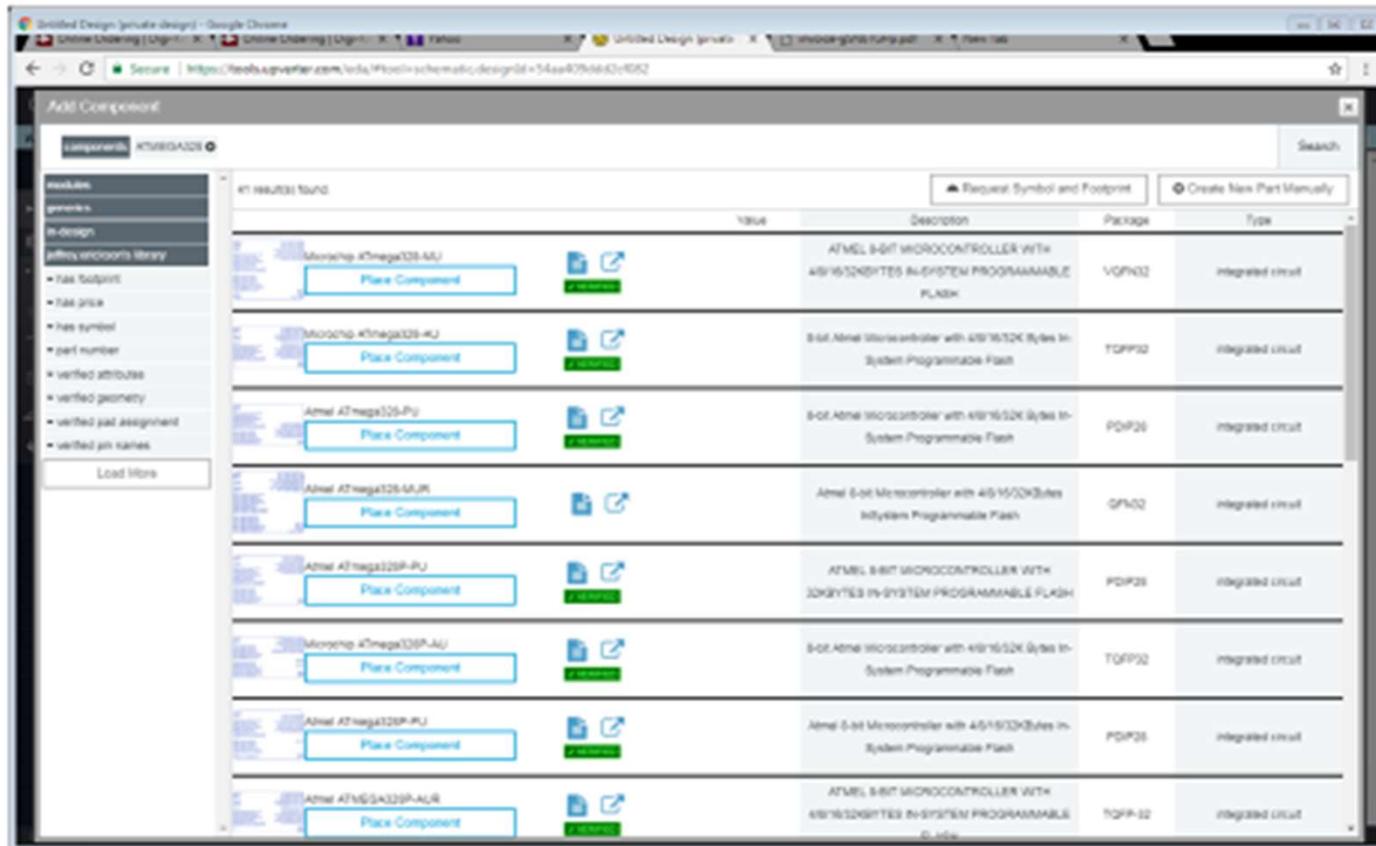
Value	Description	Package	Type
Microchip ATmega328-MU Place Component	ATMEL 8-BIT MICROCONTROLLER WITH 4/8/16/32KBYTES IN-SYSTEM PROGRAMMABLE FLASH	VQFN32	integrated circuit
Microchip ATmega328-AU Place Component	8-bit Atmel Microcontroller with 4/8/16/32K Bytes In-System Programmable Flash	TQFP32	integrated circuit
Atmel ATmega328-PU Place Component	8-bit Atmel Microcontroller with 4/8/16/32K Bytes In-System Programmable Flash	PDIP28	integrated circuit
Atmel ATmega328-MUR Place Component	Atmel 8-bit Microcontroller with 4/8/16/32KBytes InSystem Programmable Flash	QFN32	integrated circuit
Atmel ATmega328P-PU Place Component	ATMEL 8-BIT MICROCONTROLLER WITH 32KBYTES IN-SYSTEM PROGRAMMABLE FLASH	PDIP28	integrated circuit
Microchip ATmega328P-AU Place Component	8-bit Atmel Microcontroller with 4/8/16/32K Bytes In-System Programmable Flash	TQFP32	integrated circuit
Atmel ATmega328P-PU Place Component	Atmel 8-bit Microcontroller with 4/8/16/32KBytes In-System Programmable Flash	PDIP28	integrated circuit
Atmel ATMEGA328P-AUR Place Component	ATMEL 8-BIT MICROCONTROLLER WITH 4/8/16/32KBYTES IN-SYSTEM PROGRAMMABLE FLASH	TQFP-32	integrated circuit

As you can tell, this schematic is different. This is a schematic of a 555 timer that blinks an LED, after schematic is finished, the next step is to create the PCB. Press "Q" to jump back and forth from Schematic to PCB

The screenshot displays the Upverter web interface for a schematic design. The main workspace shows a circuit diagram for a 555 timer (U1, LM555CN/NOPB) configured as a blinker. The timer's +VCC pin is connected to VCC_9.0, and its GND pin is connected to GND. The TRIGGER pin is connected to GND through a 10k resistor (R1). The THRESHOLD pin is connected to GND through a 5230 resistor (R2). The DISCHARGE pin is connected to GND through a 100µF capacitor (C1). The OUTPUT pin is connected to an LED (D1, 1284-10S1017SS00-48) through a 120k resistor (R5). The LED's other terminal is connected to GND. The circuit is powered by VCC_9.0 and GND. The interface includes a toolbar on the left with various editing tools, a search bar on the right, and a bottom status bar showing zoom and pin names.

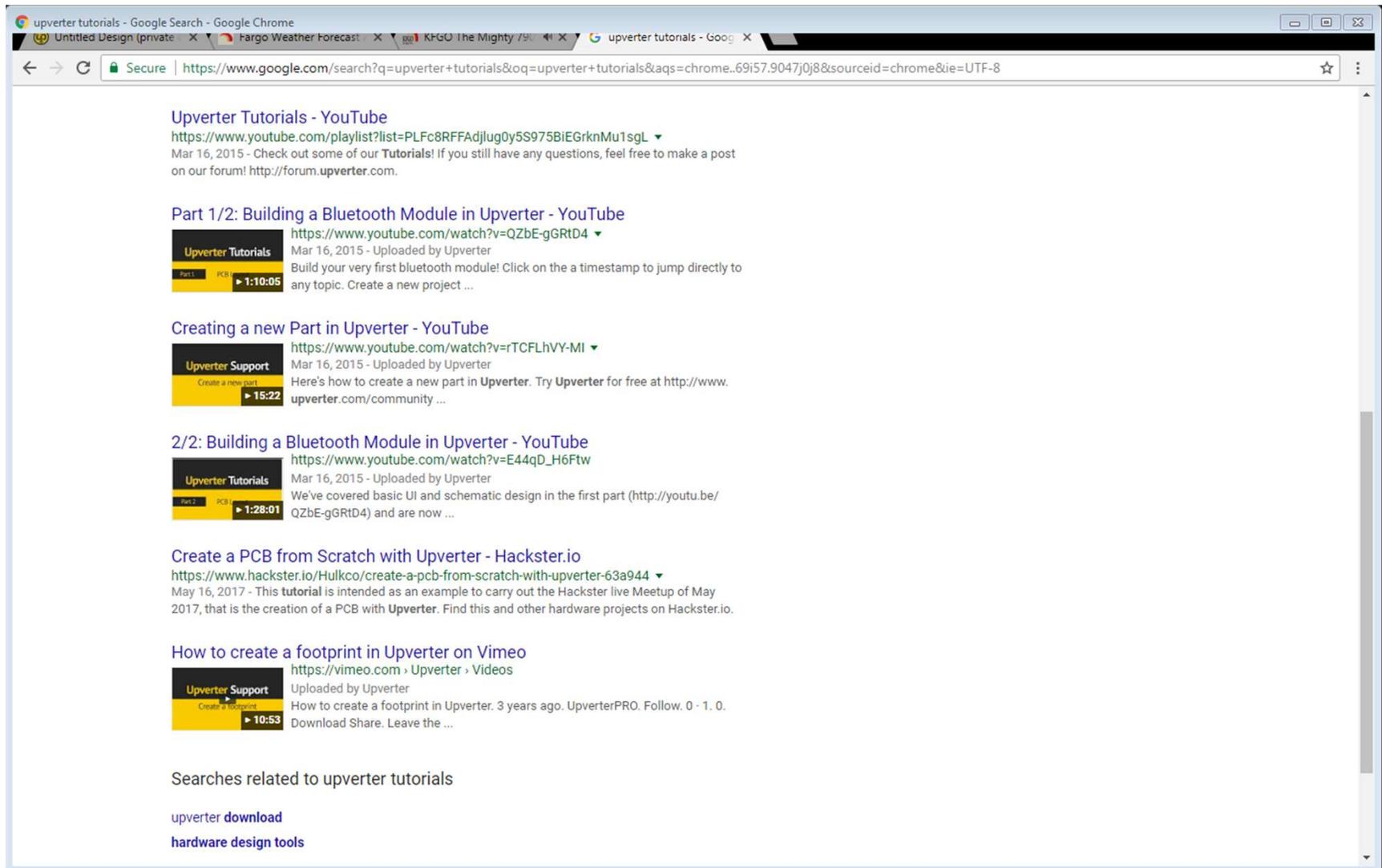
In Creating a Schematic you need to use Verified parts, If on the schematic there is no checkmark, the parts will not transfer over to the Bill of Materials list of the PCB Editor when installing a part, press “Q” and it will tab between schematic and PCB





Remember only the Verified parts will work in creating a PCB

Reminder of all the tutorials available on line and on YouTube



The screenshot shows a Google search results page for the query "upverter+tutorials". The browser's address bar shows the search URL. The results include several video links from YouTube and a link from Hackster.io. Each video result includes a thumbnail with the channel name, video title, and duration. The Hackster.io result includes a title, URL, and a brief description of the tutorial.

upverter tutorials - Google Search - Google Chrome
Secure | <https://www.google.com/search?q=upverter+tutorials&oq=upverter+tutorials&aqs=chrome..69i57.9047j0j8&sourceid=chrome&ie=UTF-8>

Upverter Tutorials - YouTube
<https://www.youtube.com/playlist?list=PLFc8RFFAdjug0y5S975BiEGrknMu1sgL>
Mar 16, 2015 - Check out some of our **Tutorials!** If you still have any questions, feel free to make a post on our forum! <http://forum.upverter.com>.

Part 1/2: Building a Bluetooth Module in Upverter - YouTube
<https://www.youtube.com/watch?v=QZbE-gGRtD4>
Mar 16, 2015 - Uploaded by Upverter
Build your very first bluetooth module! Click on the a timestamp to jump directly to any topic. Create a new project ...

Creating a new Part in Upverter - YouTube
<https://www.youtube.com/watch?v=rTCFLhVY-MI>
Mar 16, 2015 - Uploaded by Upverter
Here's how to create a new part in **Upverter**. Try **Upverter** for free at <http://www.upverter.com/community> ...

2/2: Building a Bluetooth Module in Upverter - YouTube
https://www.youtube.com/watch?v=E44qD_H6Ftw
Mar 16, 2015 - Uploaded by Upverter
We've covered basic UI and schematic design in the first part (<http://youtu.be/QZbE-gGRtD4>) and are now ...

Create a PCB from Scratch with Upverter - Hackster.io
<https://www.hackster.io/Hulkco/create-a-pcb-from-scratch-with-upverter-63a944>
May 16, 2017 - This **tutorial** is intended as an example to carry out the Hackster live Meetup of May 2017, that is the creation of a PCB with **Upverter**. Find this and other hardware projects on Hackster.io.

How to create a footprint in Upverter on Vimeo
<https://vimeo.com/Upverter/Videos>
Uploaded by Upverter
How to create a footprint in Upverter. 3 years ago. UpverterPRO. Follow. 0 - 1. 0.
Download Share. Leave the ...

Searches related to upverter tutorials

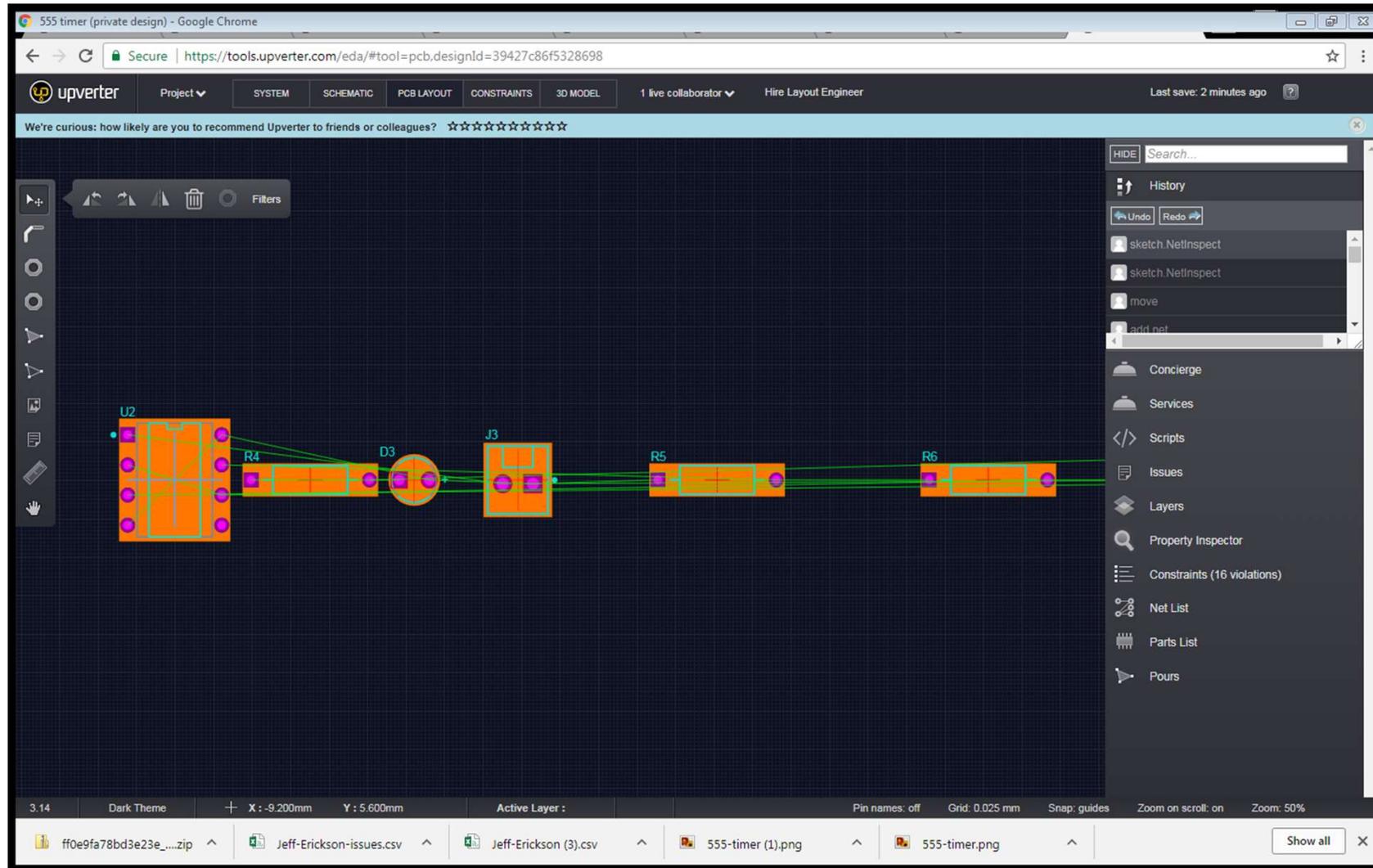
upverter download
hardware design tools

https://www.youtube.com/watch?v=E44qD_H6Ftw

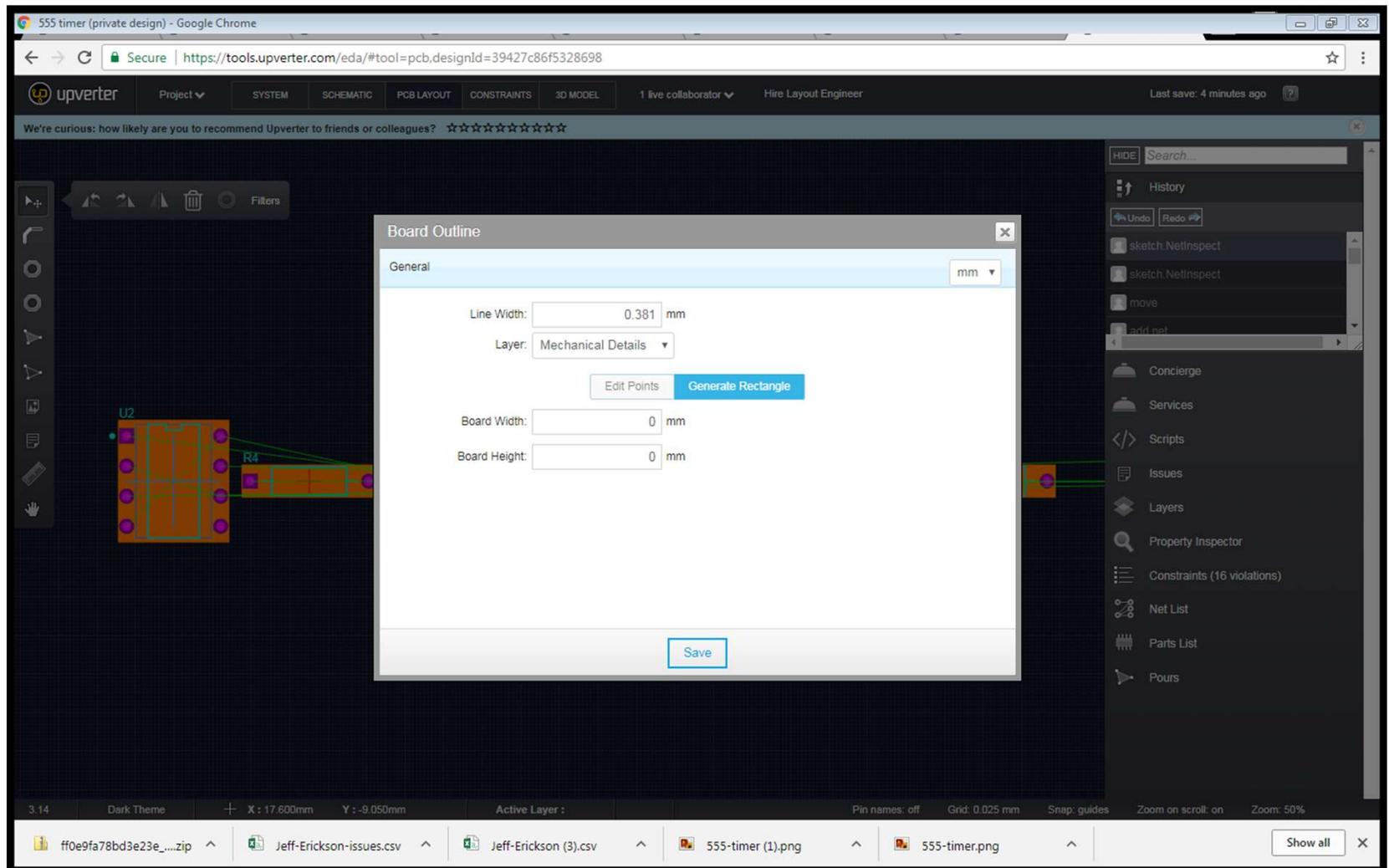
Go to this tutorial to see how to change your schematic into a pcb.

The screenshot shows a YouTube video player in a Google Chrome browser window. The video title is "2/2: Building a Bluetooth Module in Upverter" and the channel is "Upverter". The video content displays a large yellow and black graphic with the text "Upverter Tutorials" and "Part 2 PCB Layout". The video player shows a progress bar at 0:04 / 1:28:00. Below the video, there are 1,408 views, 15 likes, and 0 comments. The channel name "Upverter" is shown with a profile picture and the text "Published on Mar 16, 2015". A red "SUBSCRIBE 158" button is visible. A description below the video states: "We've covered basic UI and schematic design in the first part (<http://youtu.be/QZbE-gGRtD4>) and are now tackling the layout side of the project." To the right of the video player, there is a "Up next" section with an "AUTOPLAY" toggle. The first video in the list is "BLE Module PCB Made With Silver Paste / Laser Printer" by Rich Olson, with 26K views and a duration of 5:33. The second video is "Part 1/2: Building a Bluetooth Module in Upverter" by Upverter, with 2.2K views and a duration of 1:10:05. The third video is "Upverter // Making PCB Design Easy, Powerful and Hackster.io" by Hackster.io, with 535 views and a duration of 1:09:57. The fourth video is "How Data is Transmitted by RF Circuits (Wifi, bluetooth, phone, Robotix)" by Robotix, with 32K views and a duration of 8:52. The fifth video is "Board Building: Zak Homuth, Upverter" by Make:, with 1.1K views and a duration of 8:30. The sixth video is "Upverter Custom Board Outline (PCB)" by MazMaker, with 200 views and a duration of 6:41. The seventh video is "Connecting Parts Together" by Upverter. At the bottom of the browser window, there is a taskbar with several open files: "ff0e9fa78bd3e23e....stp", "ff0e9fa78bd3e23e....upv", "Jeff-Erickson (2).csv", "ff0e9fa78bd3e23e....svg", and "Jeff-Erickson.png". A "Show all" button is located at the bottom right of the taskbar.

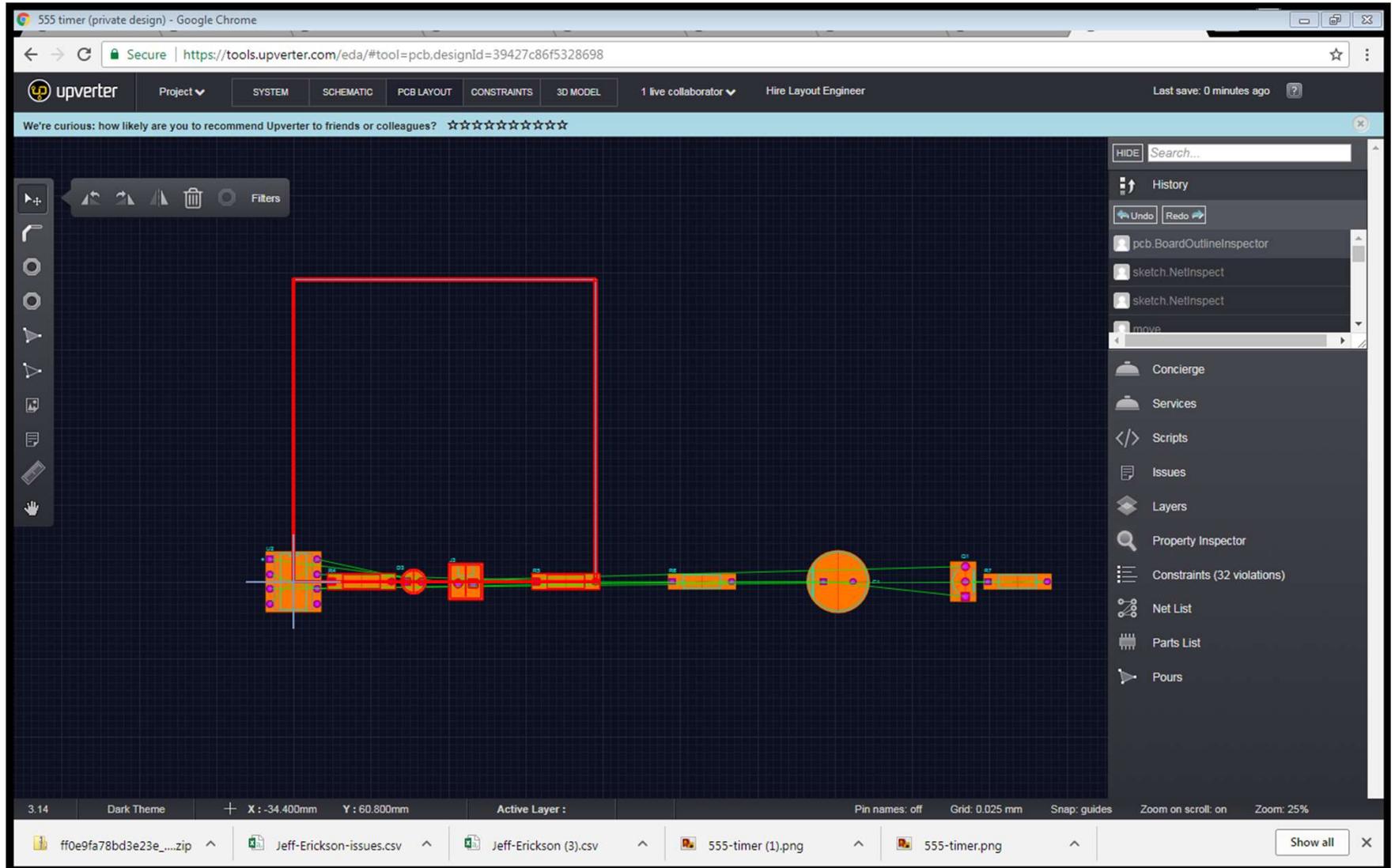
Click PCB Layout.
This should show up.
The VERIFIED Parts
and the NETS (These
are connections made
in the schematic and
altogether is called
the Rats nest.



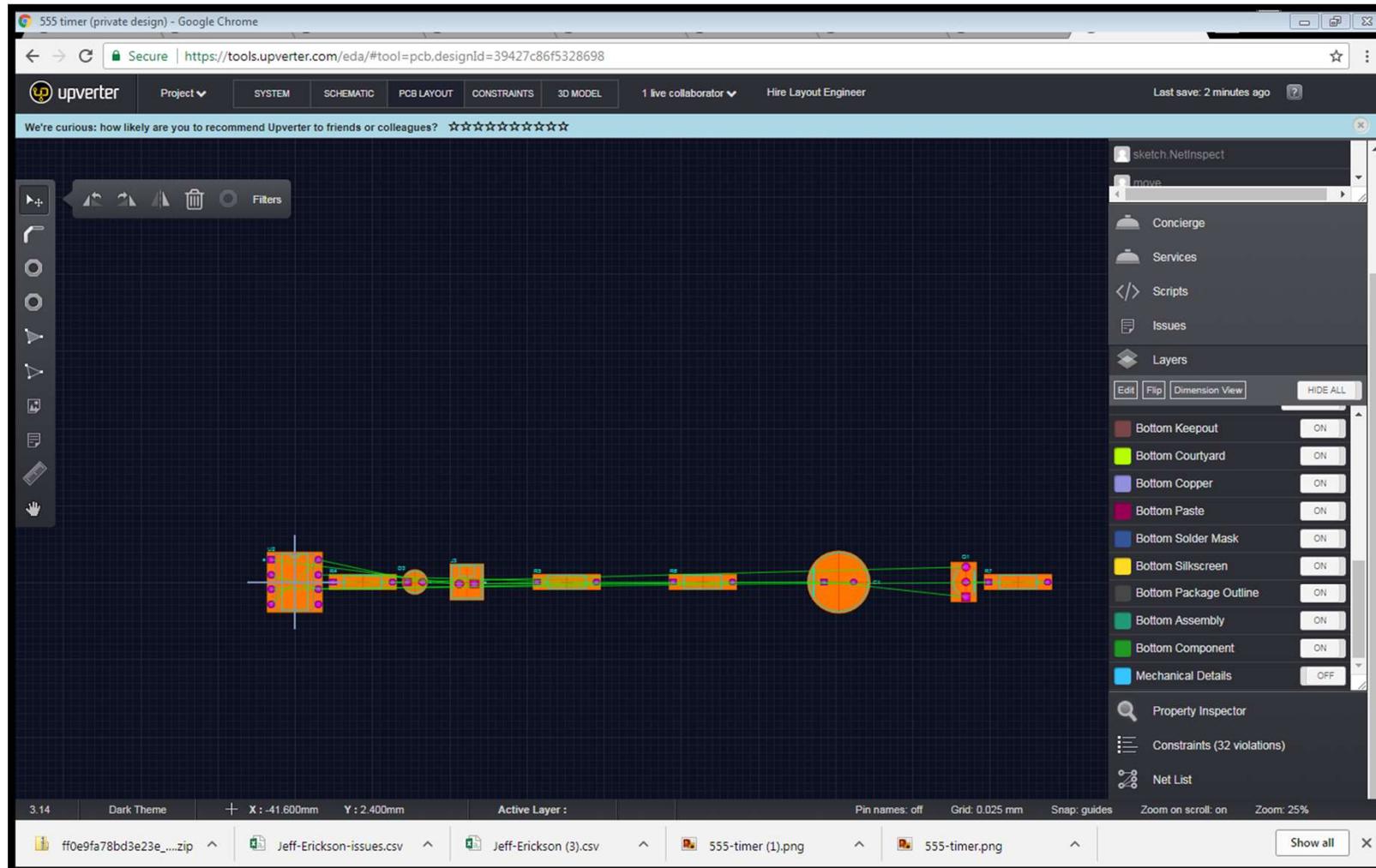
First step in creating a PCB is the dimension of the PCB, Double click anywhere on the canvas and this shows up.



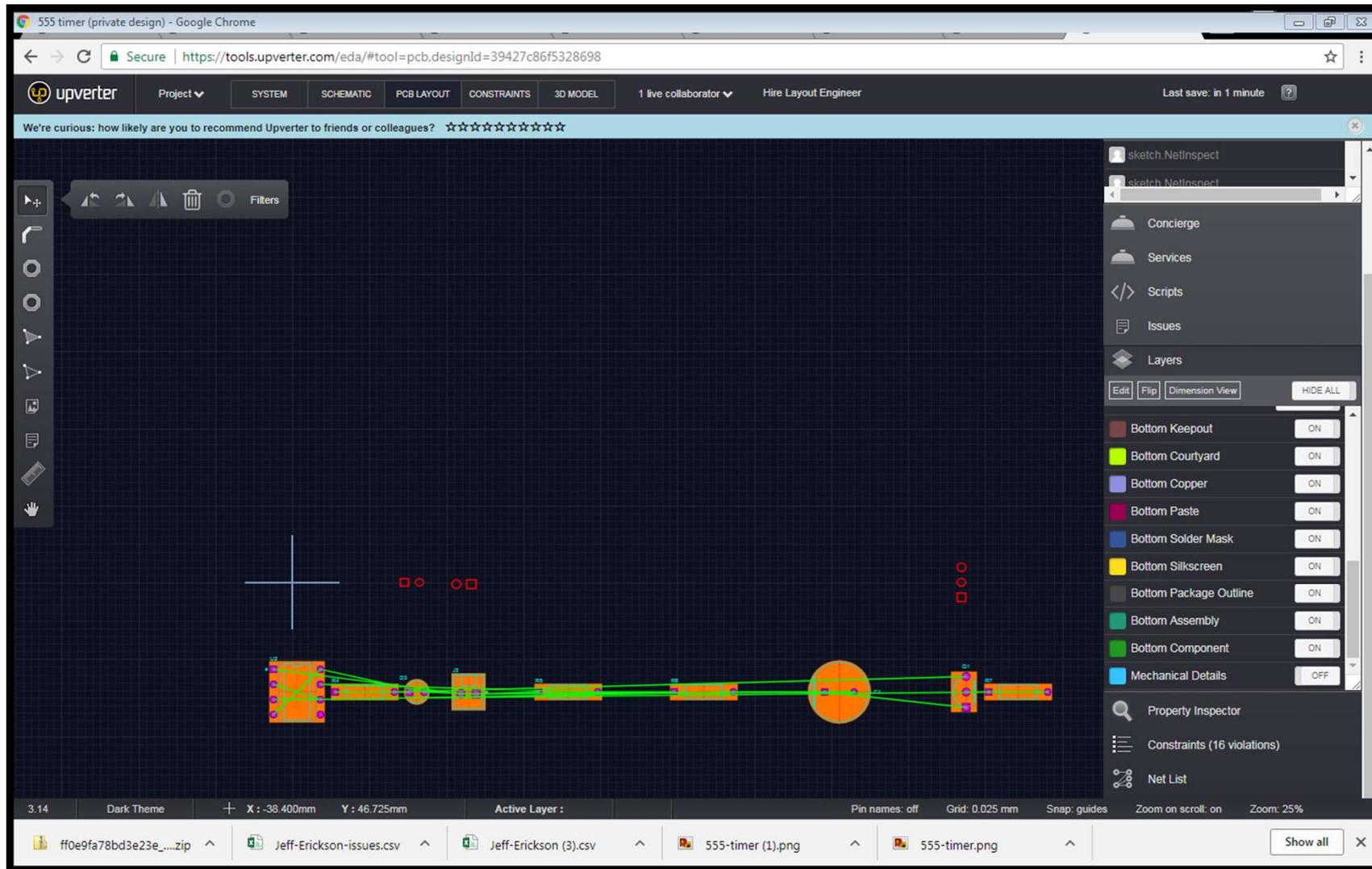
After filling in dimensions, in this case changing mm to mils, and typing in 2000mils x 2000mils, we create a pcb of 2" x 2"



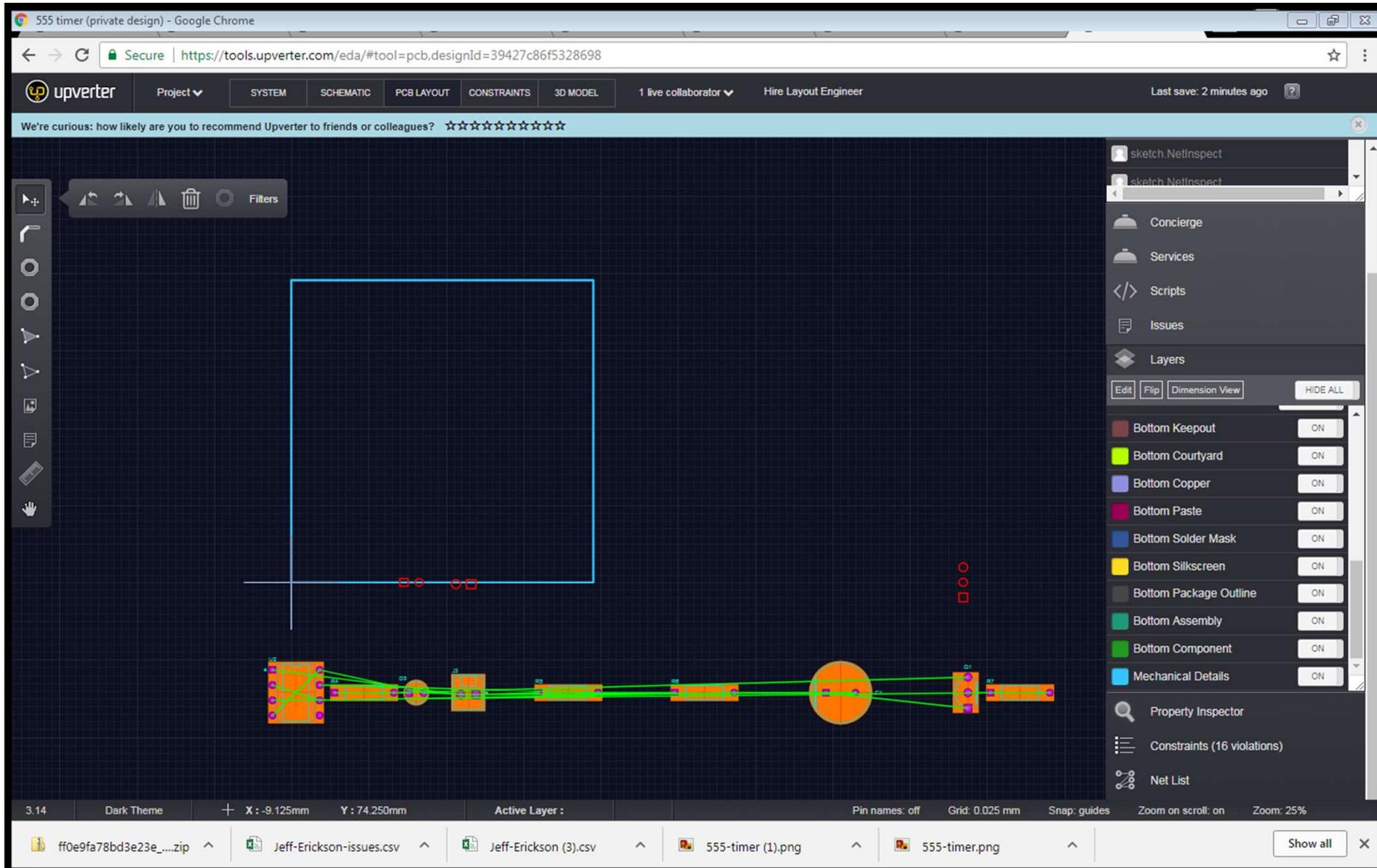
Go to the Layers tab on the right hand side, scroll down to Mechanical Layer and shut OFF, the square goes away, highlight all the visual components and move down slightly so the ORIGIN cross sits slight above all the visualized components



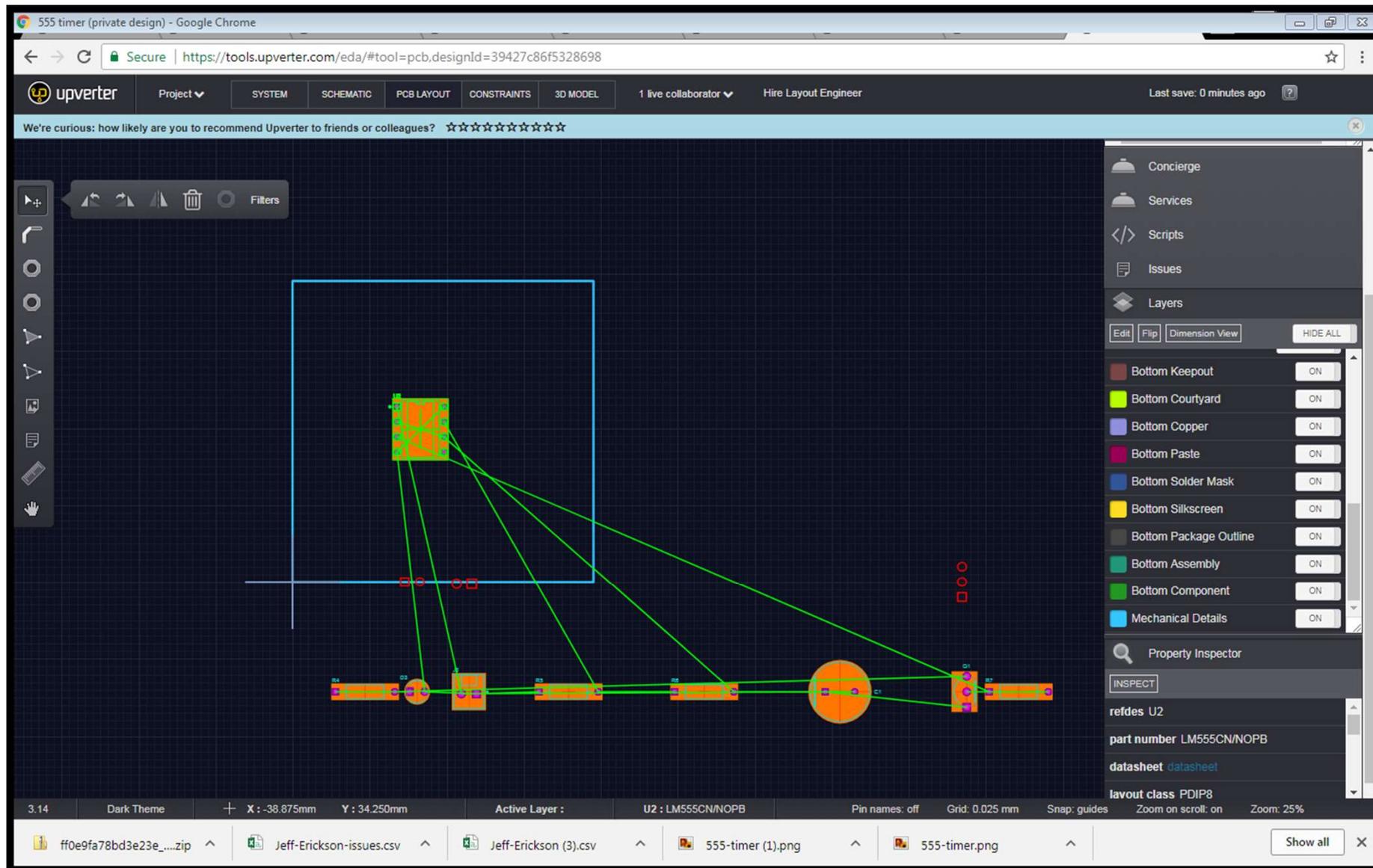
After moving all components out of the way, and turning the Mechanical Layer back on.....



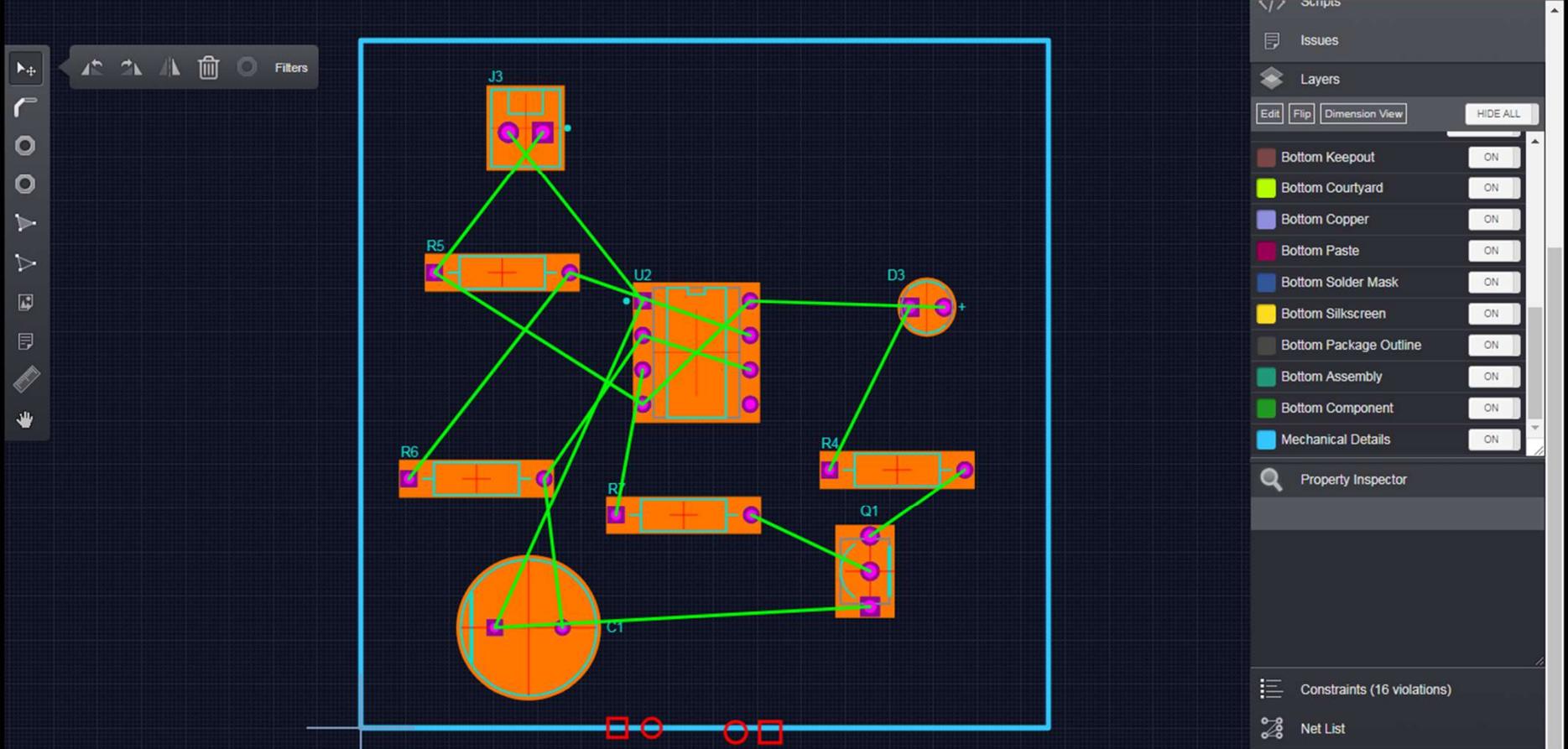
If this is what is shown the first step in PCB Fab is complete. Now highlight your parts and insert them in the box.



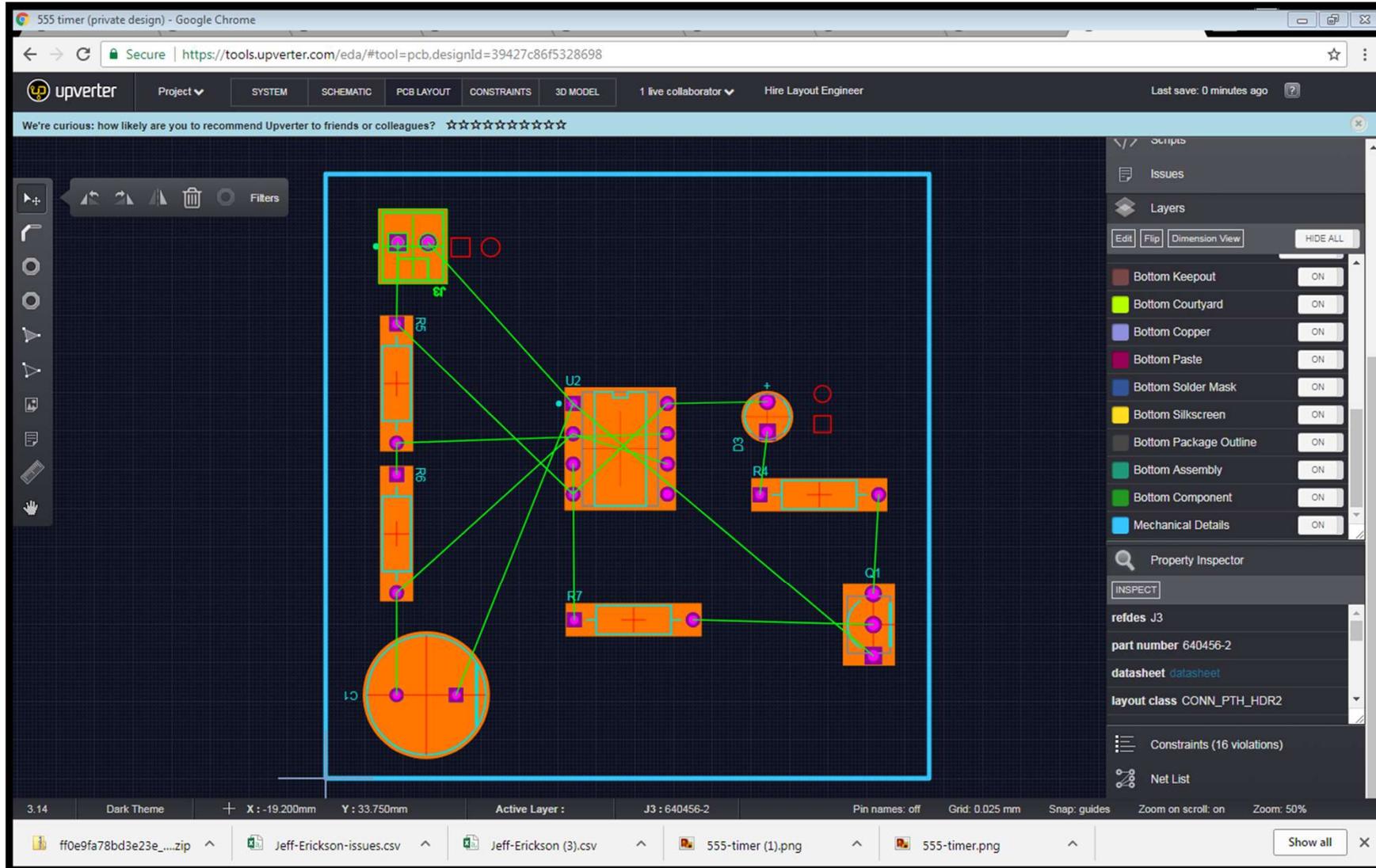
Always start with your main components and add the rest in accordance with your schematic.



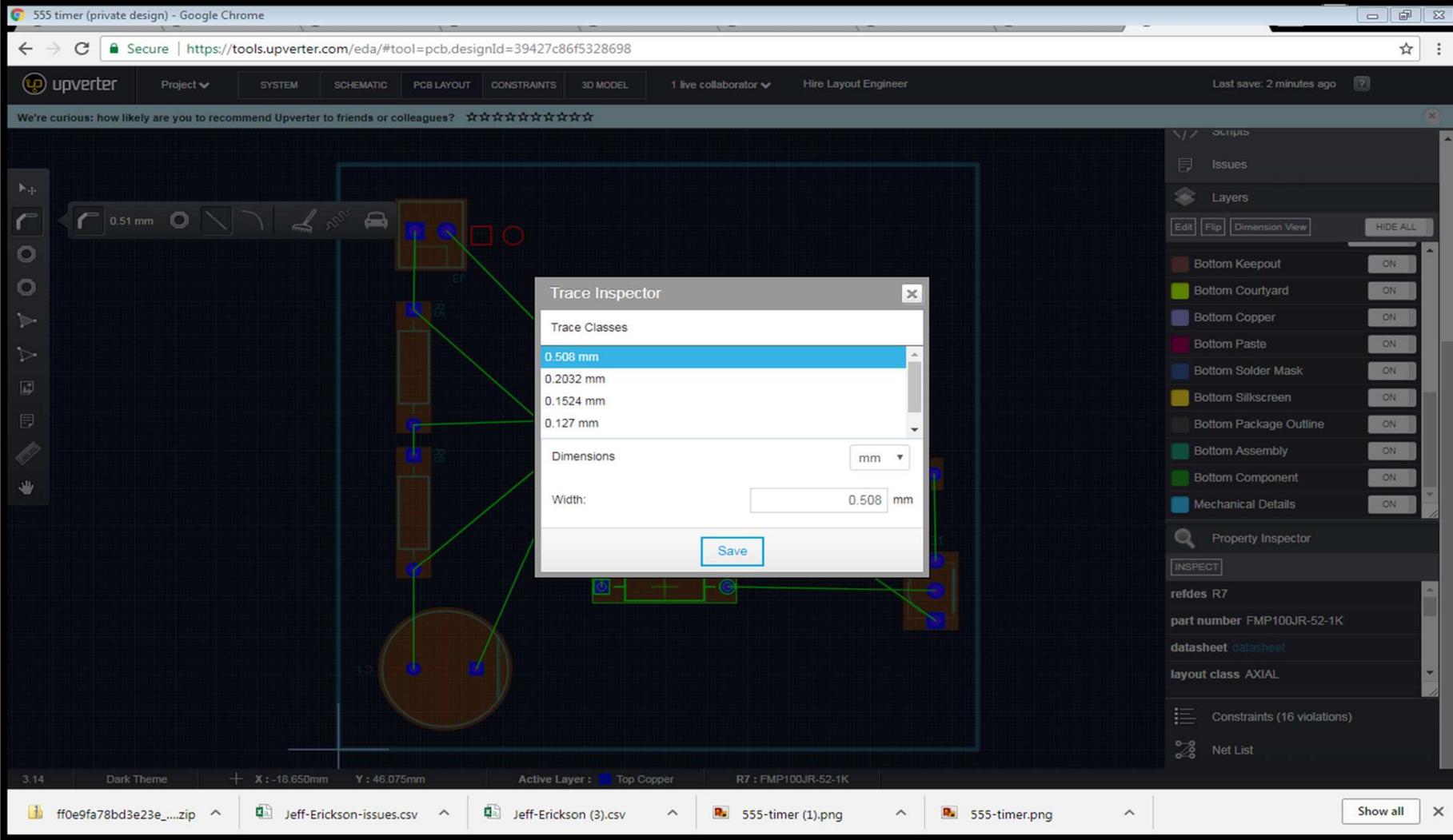
We're curious: how likely are you to recommend Upverter to friends or colleagues? ☆☆☆☆☆☆☆☆



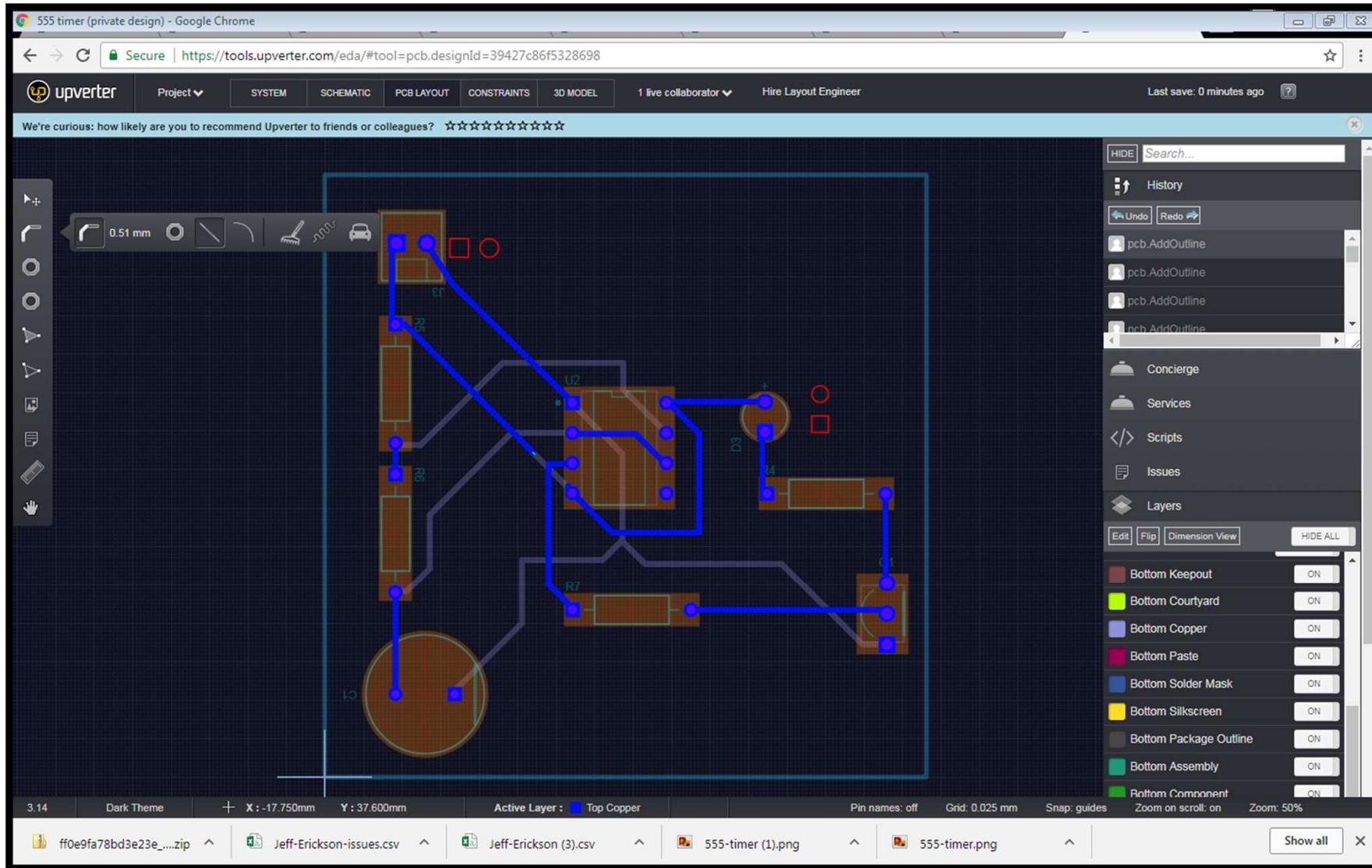
Move components around in straight lines, this also organizes the pcb, so it resembles the layout of the schematic.



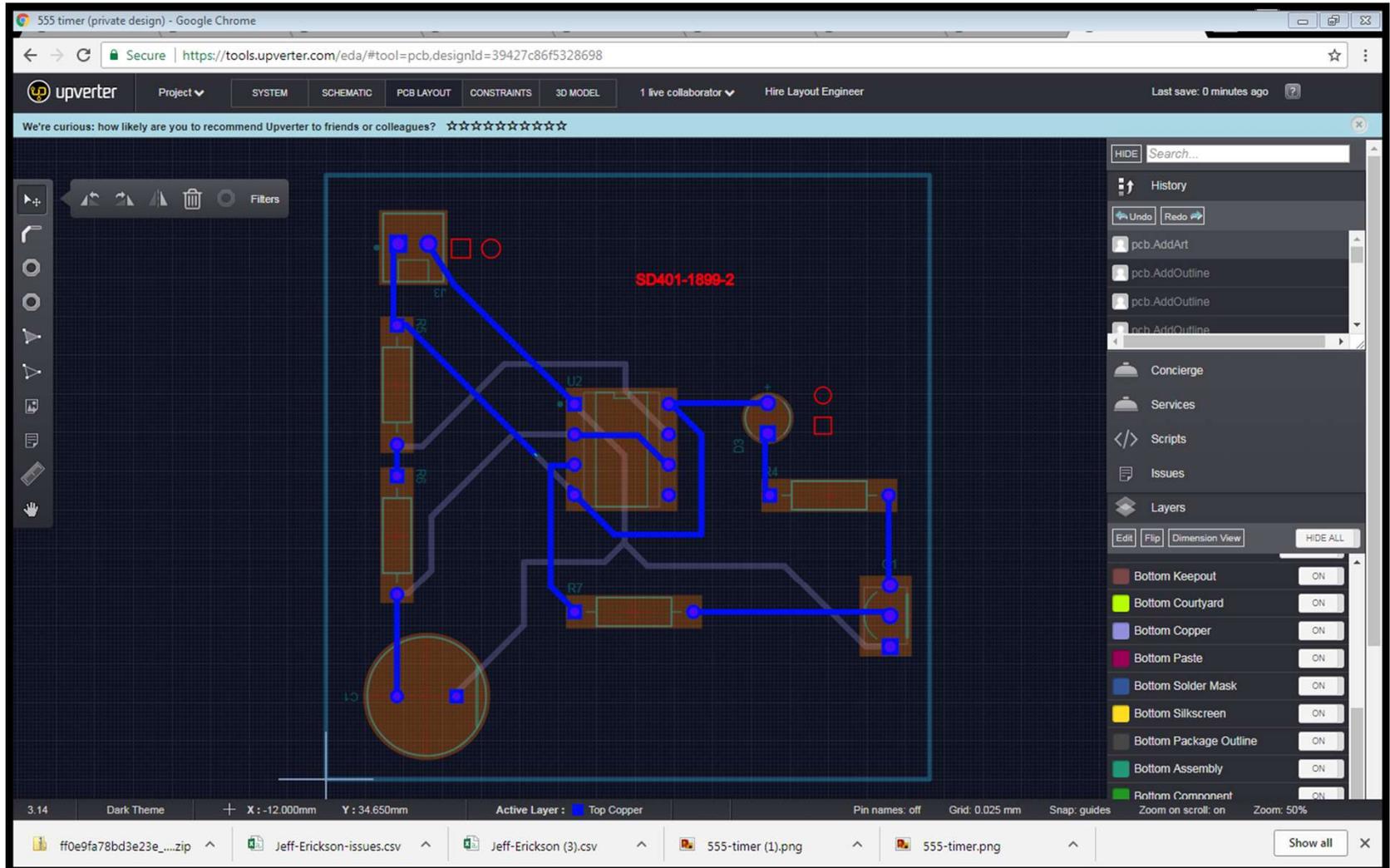
Next step is to determine the width of the trace you want to use and start adding traces, power and ground need wider traces than signal and control traces Try 20mil



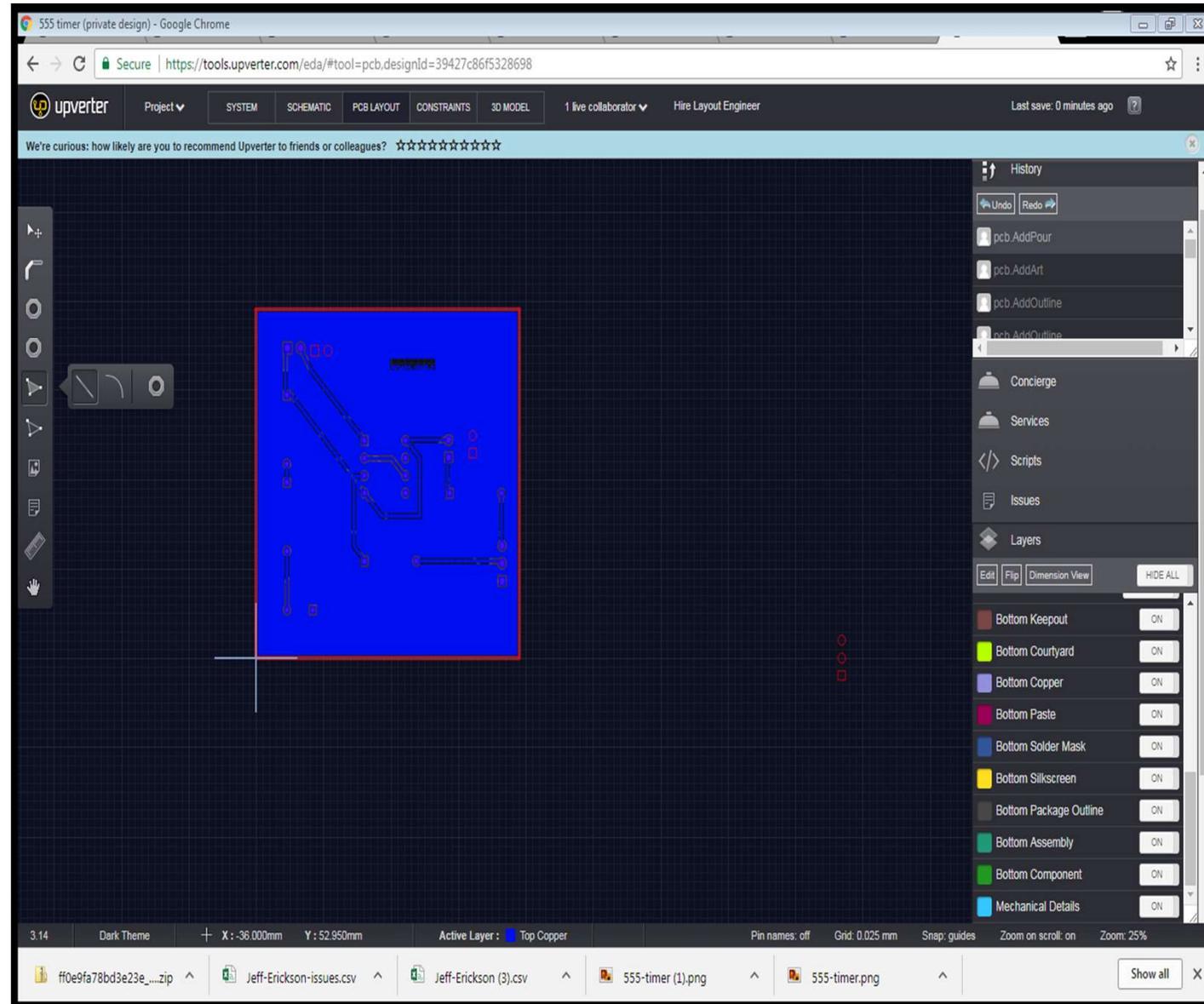
After adding all the traces (remember 1 and 2) changes from top to bottom layers. Add some text.



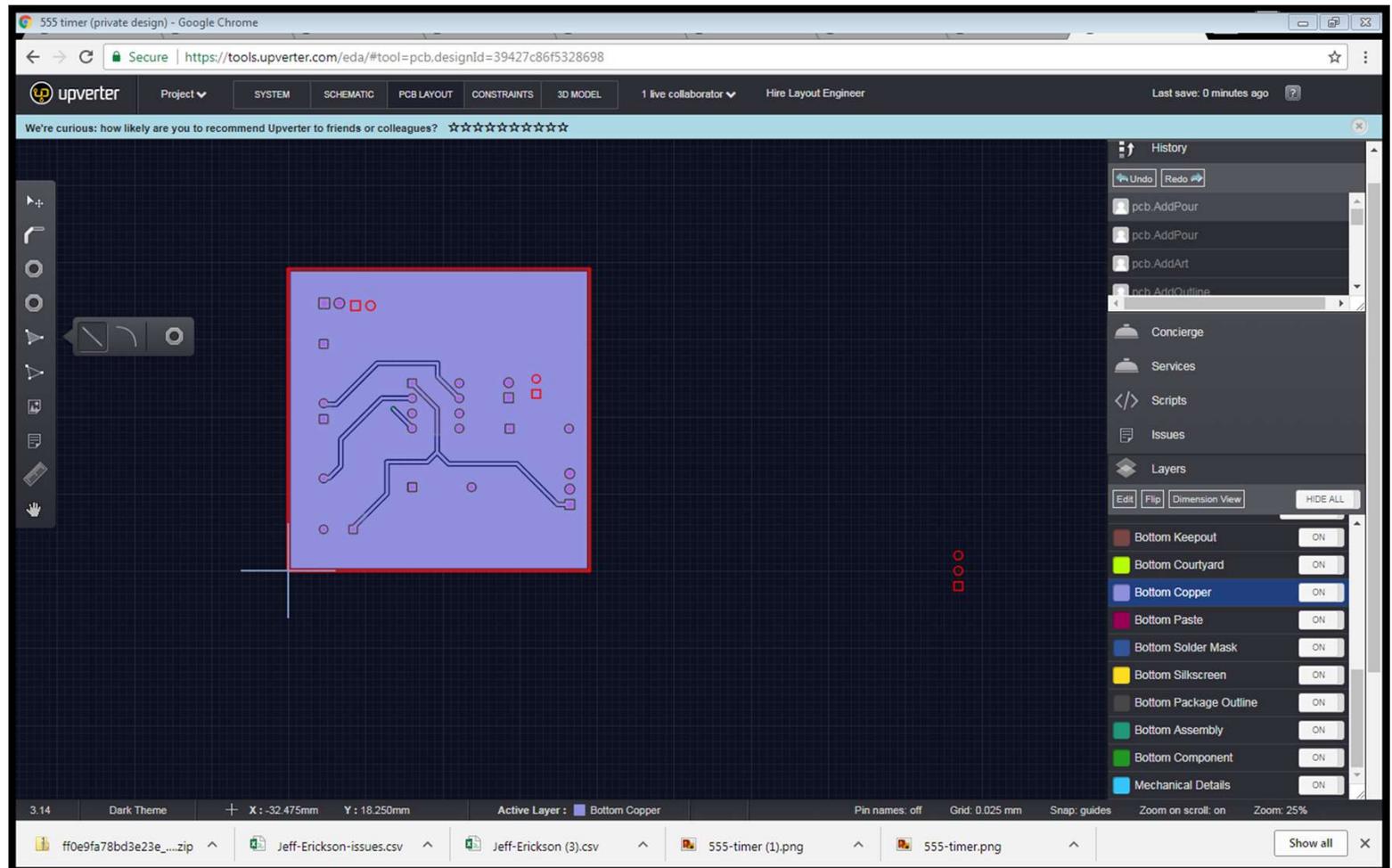
Add whatever is required for text



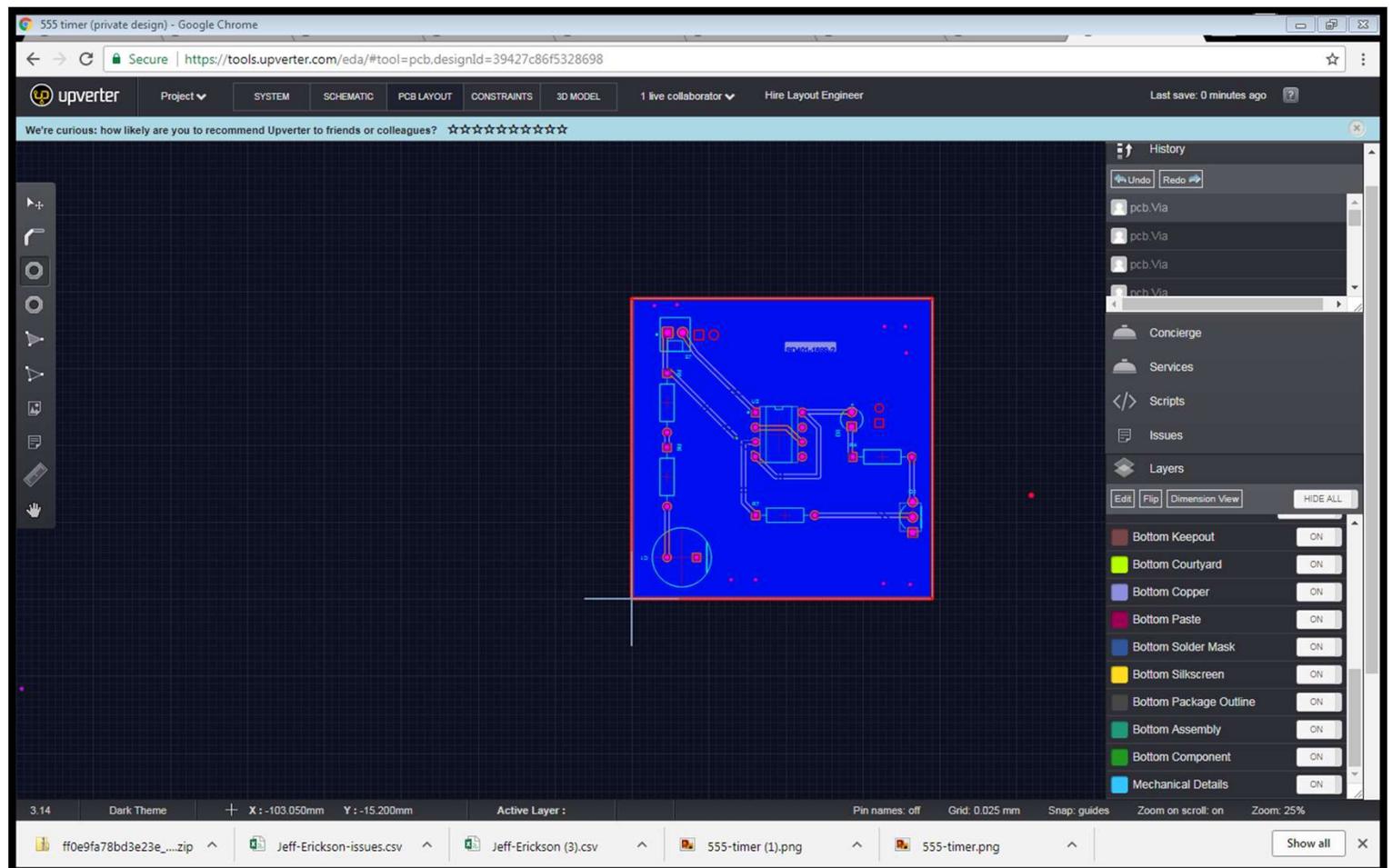
Using the Pour tool start at the ORIGIN and highlight the outside edge start bottom left/ go up/ to the right/ down/ then start to the left and stop- hit escape. No need to go all the way around 360 degrees. This should show up.



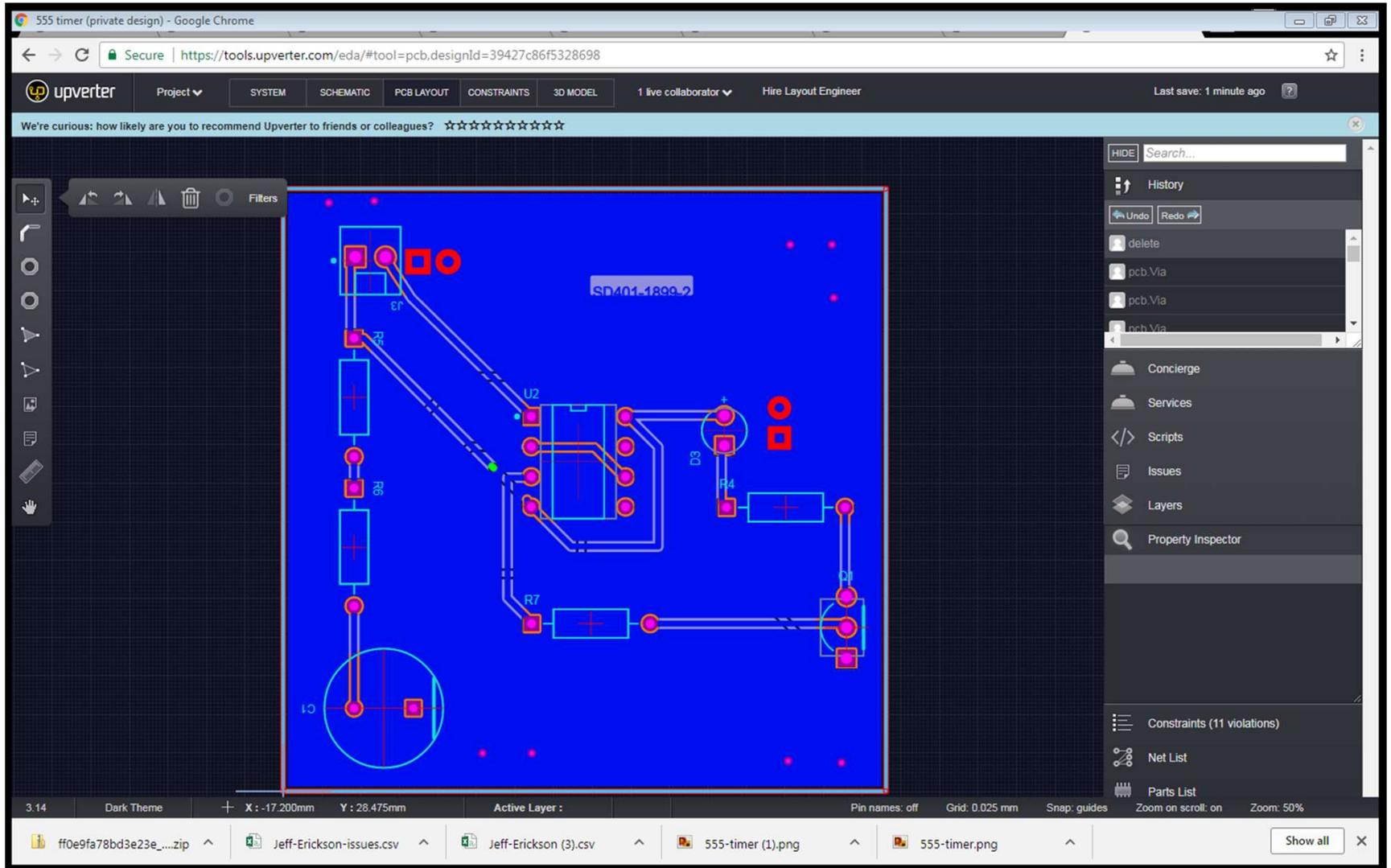
Press 2 -this will be the bottom layer and then using the pour tool start at ORIGIN , highlight the box and hit escape. This will show up.



Add VIAS to connect the top and bottom layers together if required



PC Board is now done



line	to	MI	MI
0	0	896	MI
674	674	996	MI
674	674	474.06307	MI
996.93700	996.93700	474.06307	MI
996.93700	996.93700	5.06219821	MI

2/2: Building a Bluetooth Module in Upverter

1,408 views

15 0 SHARE



Upverter
Published on Mar 16, 2015

SUBSCRIBE 158

We've covered basic UI and schematic design in the first part (<http://youtu.be/QZbE-gGRtD4>) and are now tackling the layout side of the project.

SHOW MORE

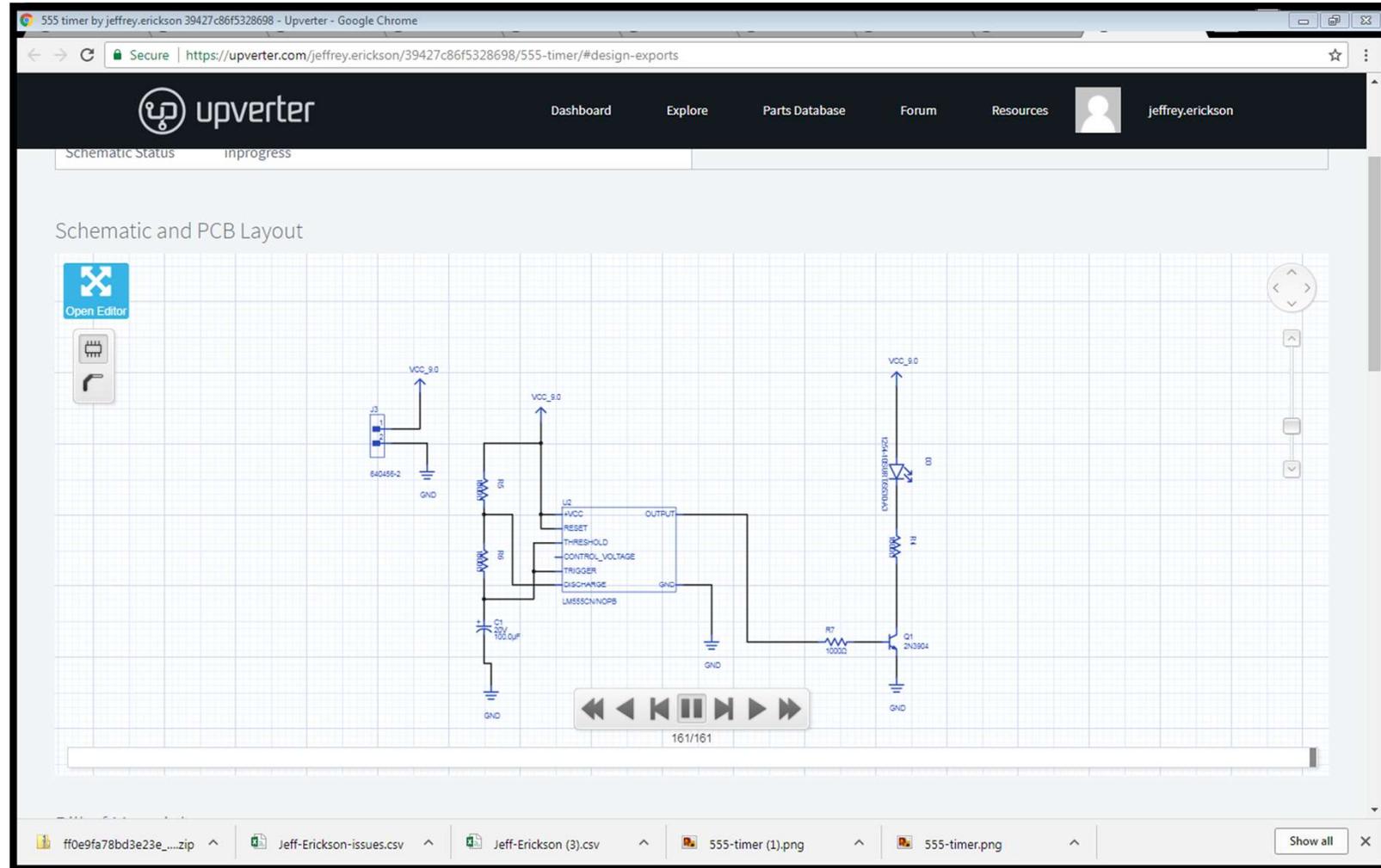
- Up next AUTOPLAY
- Upverter Support**
Creating a new Part in Upverter
Upverter
1K views
Create a new part
15:22
 - Upverter Tutorials**
Part 1 PCB Layout
1:10:05
Part 1/2: Building a Bluetooth Module in Upverter
Upverter
2.2K views
 - Upverter Support**
BLE Module PCB Made With Silver Paste / Laser Printer
Rich Olson
26K views
5:33
 - Upverter Support**
Connecting Parts Together
Upverter
90 views
Connecting Parts Together
1:31
 - Upverter Support**
Editing your Schematic in Upverter
Upverter
432 views
Schematic Editor walkthrough
2:09
 - Upverter Tutorials**
Upverter Overview
Upverter
3.2K views
Overview
3:24
 - Upverter // Making PCB Design Easy, Powerful and**
Hackster.io
535 views
1:09:57

Once finished , you will need to create the Gerber files which are then exported to companies that make PCB's, such as Advanced Circuits, or in our case we will use OSH Park.com.

Upverter to Gerber files exported. **Go to dashboard and press ----- Project ----- Export Files**

Once seeing this image of your schematic, **scrolling down you will see.....**

Your schematic.....
Scrolling further.....



Bill of materials- IF you used verified components- Generics won't show up

Bill of materials....

Scrolling further.....

The screenshot shows the Upverter web interface for a project named "555 timer by jeffrey.erickson". The page displays a "Bill of Materials" table with the following data:

Reference	Description	Manufacturer	Part Number	Package	Verified	Actual Part	Qty	Unit Cost	Order Qty	Total Cost
R4, R5, R6, R7	Metal Film Resistors	YAGEO	FMP100JR-52-1K	AXIAL	✓	No Digi-key Number	4	??	0	0
J3	0.1" 2pos Pin header connector	TE	640456-2	CONN_PTH_HDR2	✓	A1921-ND	1	0.12	1	0.12
C1	CAP, ALU ELEC, 100UF, 20V, RAD	Panasonic	20SEP100MX	RADIAL	✓	678D107M050CG3D-ND	1	0	1	0.0
D3	Hyper Red 3.0mm Round Type LED	Everlight	1254-10SURT/S530-A3	RADIAL	✓	1254-10SURT/S530-A3-ND	1	0	1	0.0
Q1	NPN General Purpose Amplifier	Fairchild	2N3904	TO-92-3	✓	No Digi-key Number	1	??	0	0
U2	LM555 Timer	Texas Instruments	LM555CN/NOPB	PDIP8	✓	No Digi-key Number	1	??	0	0

Below the table is the "Export Design Data" section, which includes several options for exporting design information:

- Open JSON Format: All model data in Upverter's Open JSON export format (more info)
- Gerber Format (RS-274X extended): CAD to CAM transfer instructions (more info)
- NC Drill (Excellon): NC drill and route machine instructions (more info)
- PADS Layout Netlist: Export your schematic into a third-party layout tool
- Dimension Drawing: Export the board outline, holes, and rulers
- Assembly Drawing: Export the board outline, part designators, and locations

The browser's taskbar at the bottom shows several open files, including "ff0e9fa78bd3e23e_....zip", "Jeff-Erickson-issues.csv", "Jeff-Erickson (3).csv", "555-timer (1).png", and "555-timer.png".

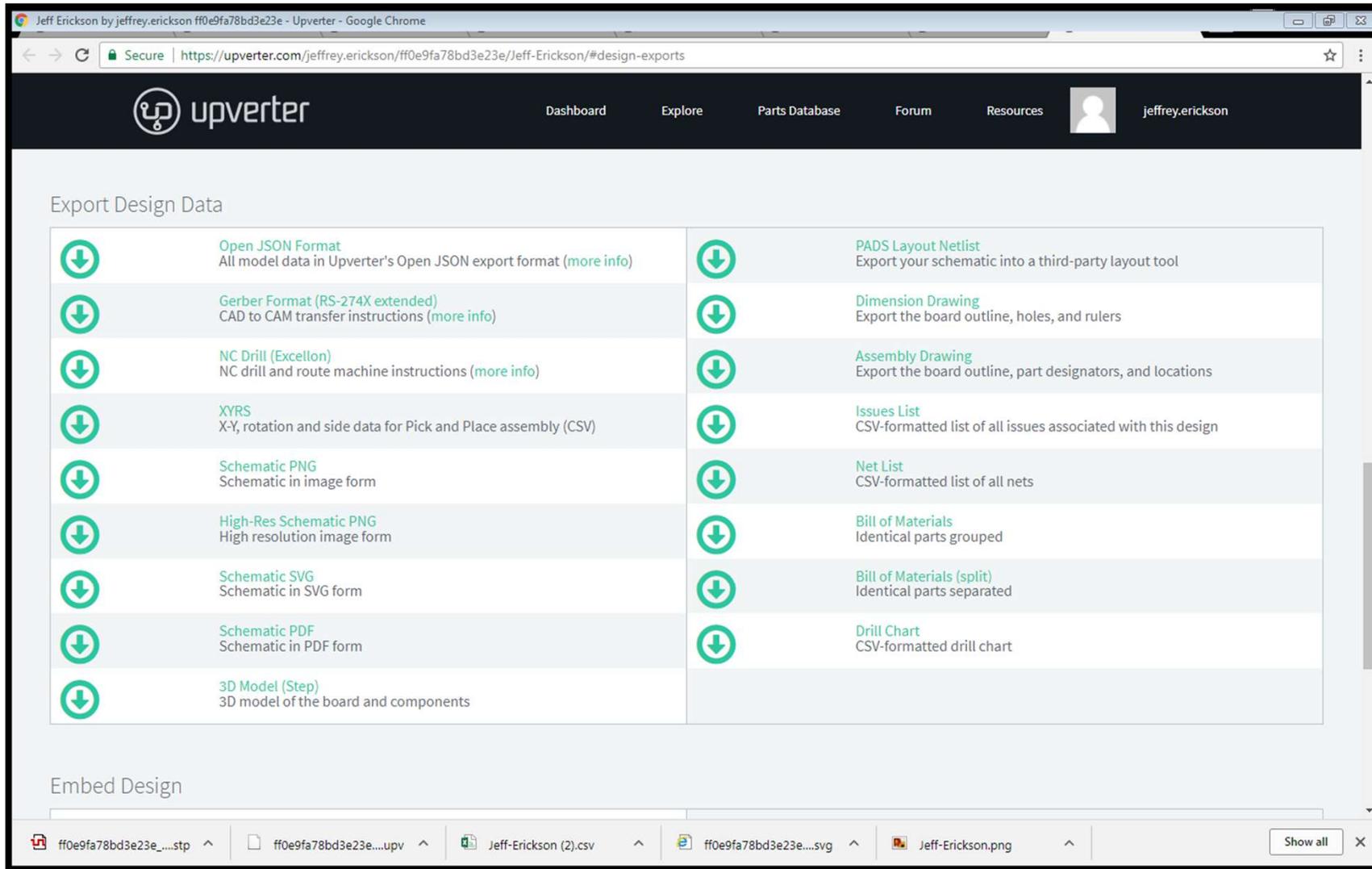
Scrolling down you will see this they are to export all files, such as Schematic in PDF format, or Bill of Materials

Export files...

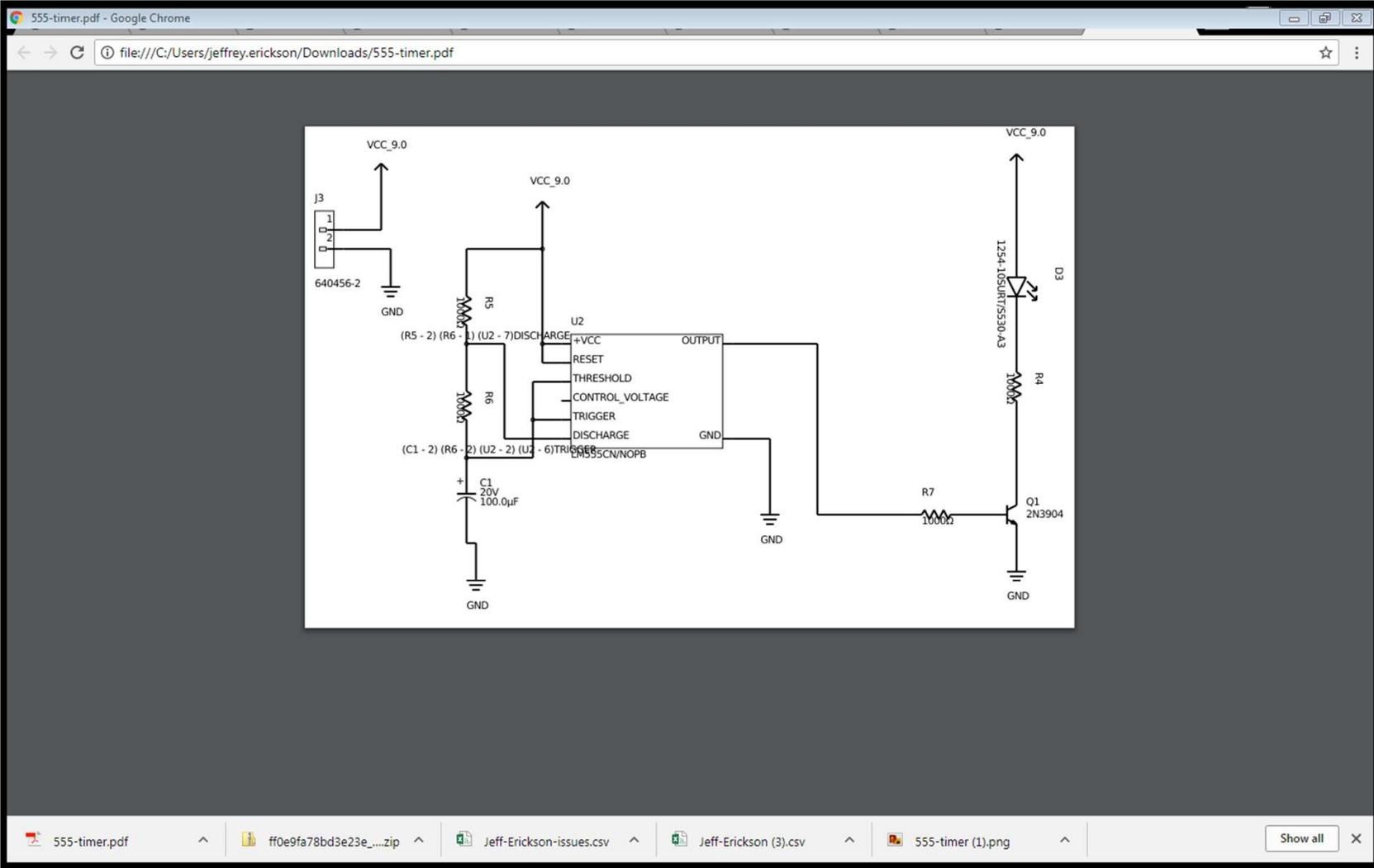
Gerber files are also saved along with NC Drill files, which are then zipped and sent to.....

A Gerberviewer.com

For checking

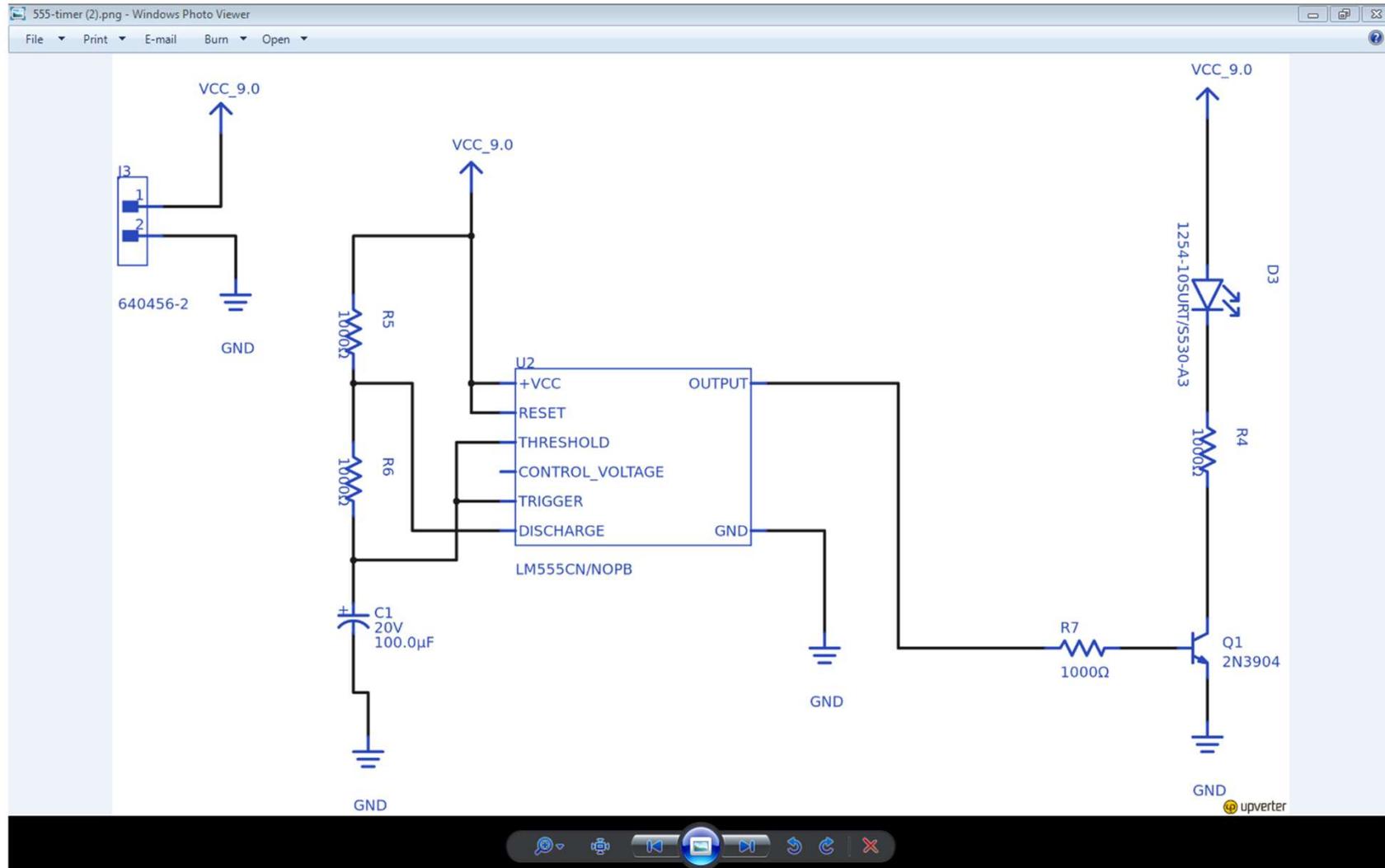


You may download your schematic as a pdf



Or as a .png file.....

Which is a Higher resolution Schematic image.



Download the projects bill of materials as an Excel spreadsheet... convert to pdf... etc.

Reference	Description	Manufact	Manufac	Suppliers	Package	Quantity	Mouser P	Capacitan	Digikey P	Esr	Category	Category	Verified	P	Temperat	Centroid	Verified	A	Category	Verified	P	Capacitan	Imported	Digikey
C1	CAP, ALU	Panasonic	20SEP100F	Digi-Key	6 RADIAL	1	667-20SEP	±20%	P16306-NI	35mΩ	Single Cor	Uncategor	TRUE		-55°C	No	TRUE	Passive Cc	TRUE		100.0	μF	octopart	CAP AL
D3	Hyper Rec Everlight	1254-10SL	Digi-Key	1 RADIAL		1	638-125410	SURTS53C	1254-10SUR	/S530-A3-ND			TRUE		-40°C	No	TRUE		TRUE				octopart	LED REC
J3	0.1" 2pos	TE	640456-2	Digi-Key	A CONN_PT	1	571-6404562		A1921-ND				TRUE		-55°C	No	TRUE		TRUE				octopart	CONN H
Q1	NPN Gene	Fairchild	2N3904		TO-92-3	1	512-2N3904BU		2N3904FS-ND				TRUE		-55°C	Yes	TRUE		TRUE					TRANS
R4 R5 R6 R	Metal Filn	YAGEO	FMP100JR-52-1K		AXIAL	4	603-FMP100JR-52-1K	1KWCT-ND					TRUE		-55°C	No	TRUE		TRUE					1 kOhm
U2	LM555 Tin	Texas Inst	LM555CN/NOPB		PDIP8	1	926-LM555CN/NOPB		LM555CNNS/NOPB-ND				TRUE		0°C	No	TRUE		TRUE				Altium	IC OSC

To generate Gerber files – use the Gerber Format (RS-274X extended) *read directions if required*

Jeff Erickson by jeffrey.erickson ff0e9fa78bd3e23e - Upverter - Google Chrome

Secure | <https://upverter.com/jeffrey.erickson/ff0e9fa78bd3e23e/jeff-Erickson/#design-exports>

upverter Dashboard Explore Parts Database Forum Resources jeffrey.erickson

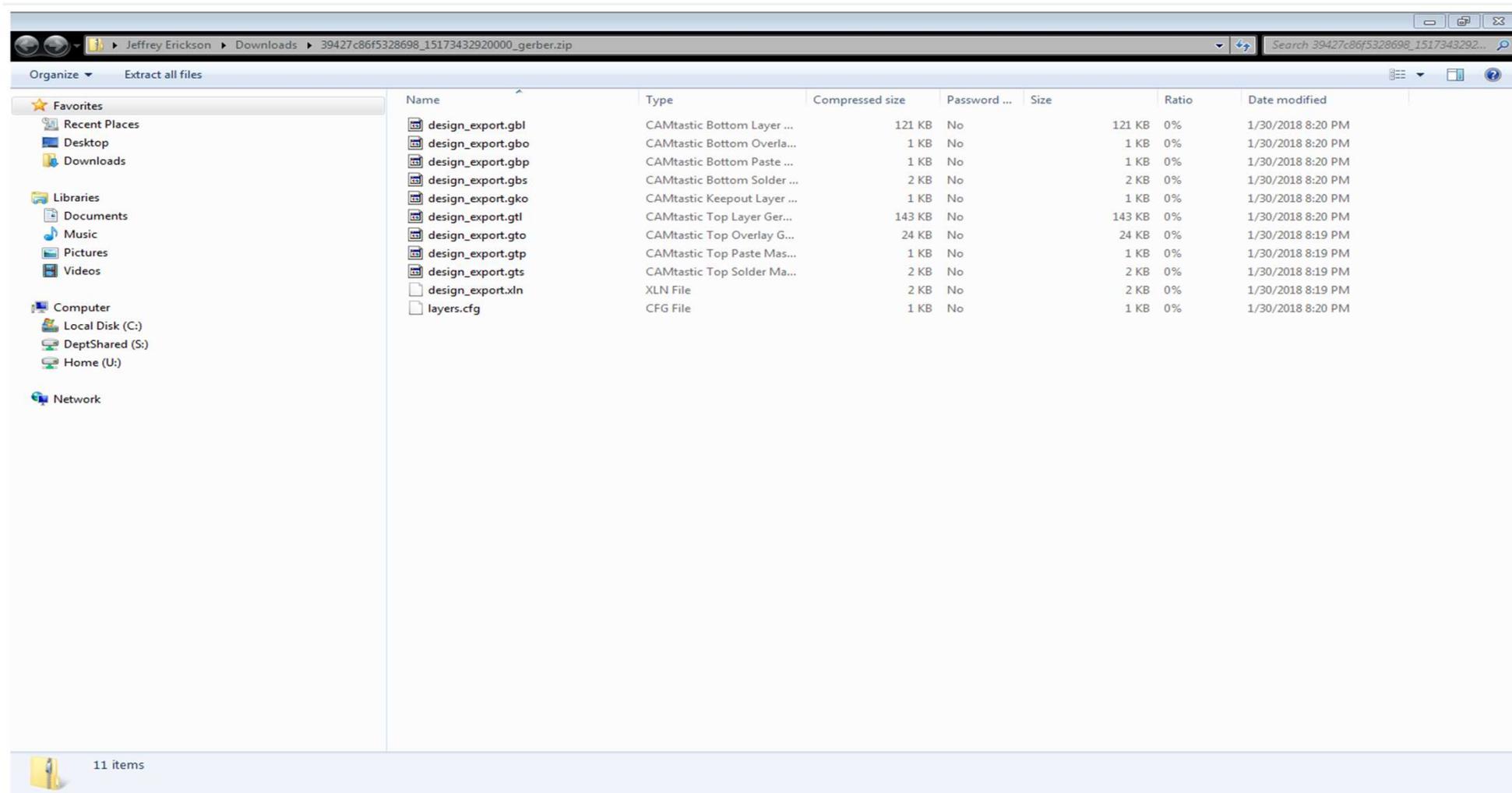
Export Design Data

 Open JSON Format All model data in Upverter's Open JSON export format (more info)	 PADS Layout Netlist Export your schematic into a third-party layout tool
 Gerber Format (RS-274X extended) CAD to CAM transfer instructions (more info)	 Dimension Drawing Export the board outline, holes, and rulers
 NC Drill (Excellon) NC drill and route machine instructions (more info)	 Assembly Drawing Export the board outline, part designators, and locations
 XYRS X-Y, rotation and side data for Pick and Place assembly (CSV)	 Issues List CSV-formatted list of all issues associated with this design
 Schematic PNG Schematic in image form	 Net List CSV-formatted list of all nets
 High-Res Schematic PNG High resolution image form	 Bill of Materials Identical parts grouped
 Schematic SVG Schematic in SVG form	 Bill of Materials (split) Identical parts separated
 Schematic PDF Schematic in PDF form	 Drill Chart CSV-formatted drill chart
 3D Model (Step) 3D model of the board and components	

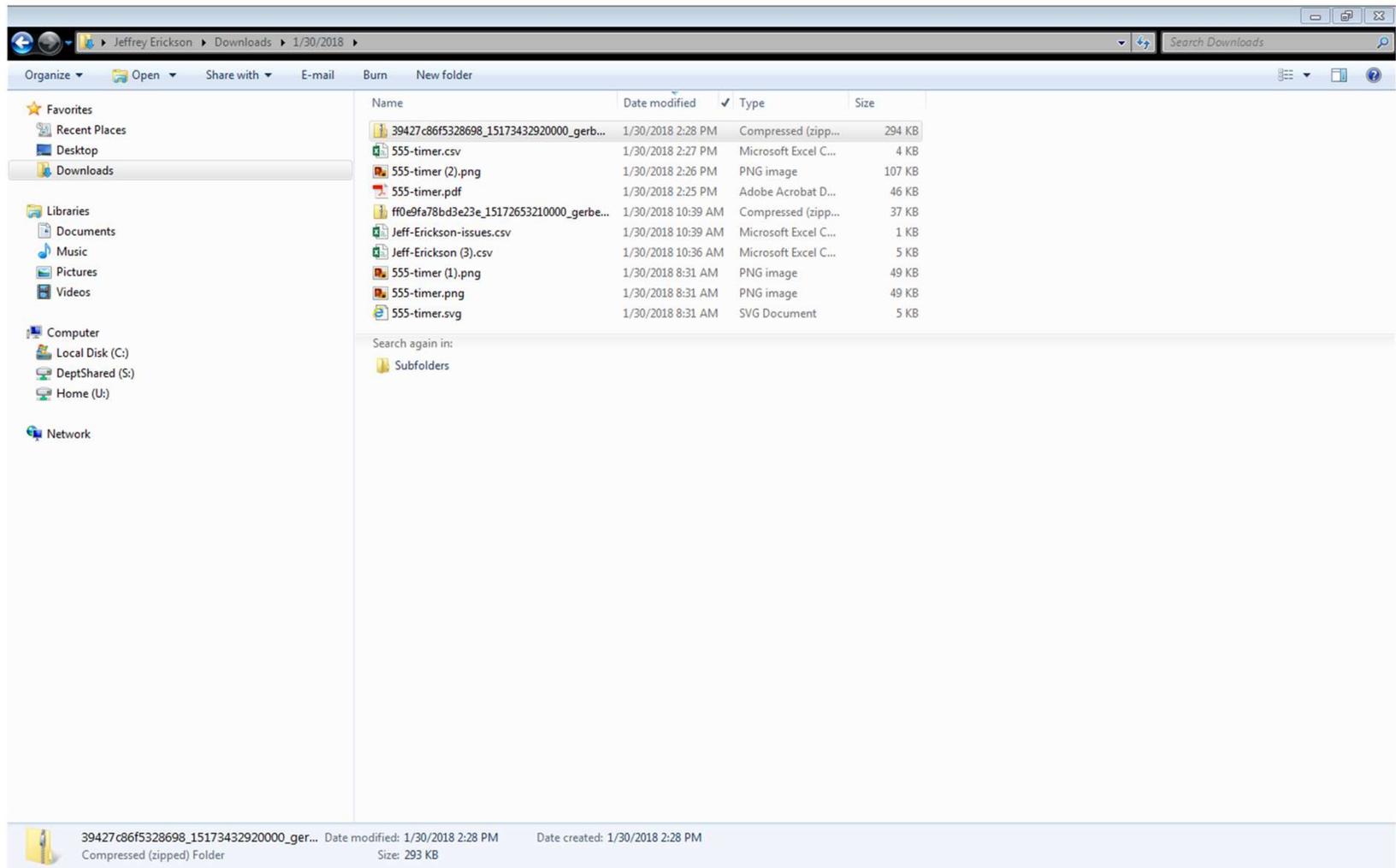
Embed Design

ff0e9fa78bd3e23e_...zip Jeff-Erickson-issues.csv Jeff-Erickson (3).csv 555-timer (1).png 555-timer.png Show all

It will automatically download these files, which contain all gerbers as well as xln drill files



It also will compress the files automatically , which are needed to check them for accuracy.... Send the zipped files to gerbviewer.com.....





Online Gerber-Viewer

214
Like
Share

Viewer

Donate

Info

Links

Contact

PCB-Investigator



Photo-realistic

Test 30 days for free!

Software Development

>> [Open Demo Design](#) or select Gerber274X, Excellon1/2 or Zip-File:

Choose File No file chosen

show format settings

mm inch

Zoom Measure

- design_export.gbs
- design_export.gtp
- design_export.gko
- design_export.gtl
- design_export.gbp
- design_export.gto
- design_export.gbo
- design_export.xln
- design_export.gbl
- design_export.gts

Clear All

www.gerber-viewer.com

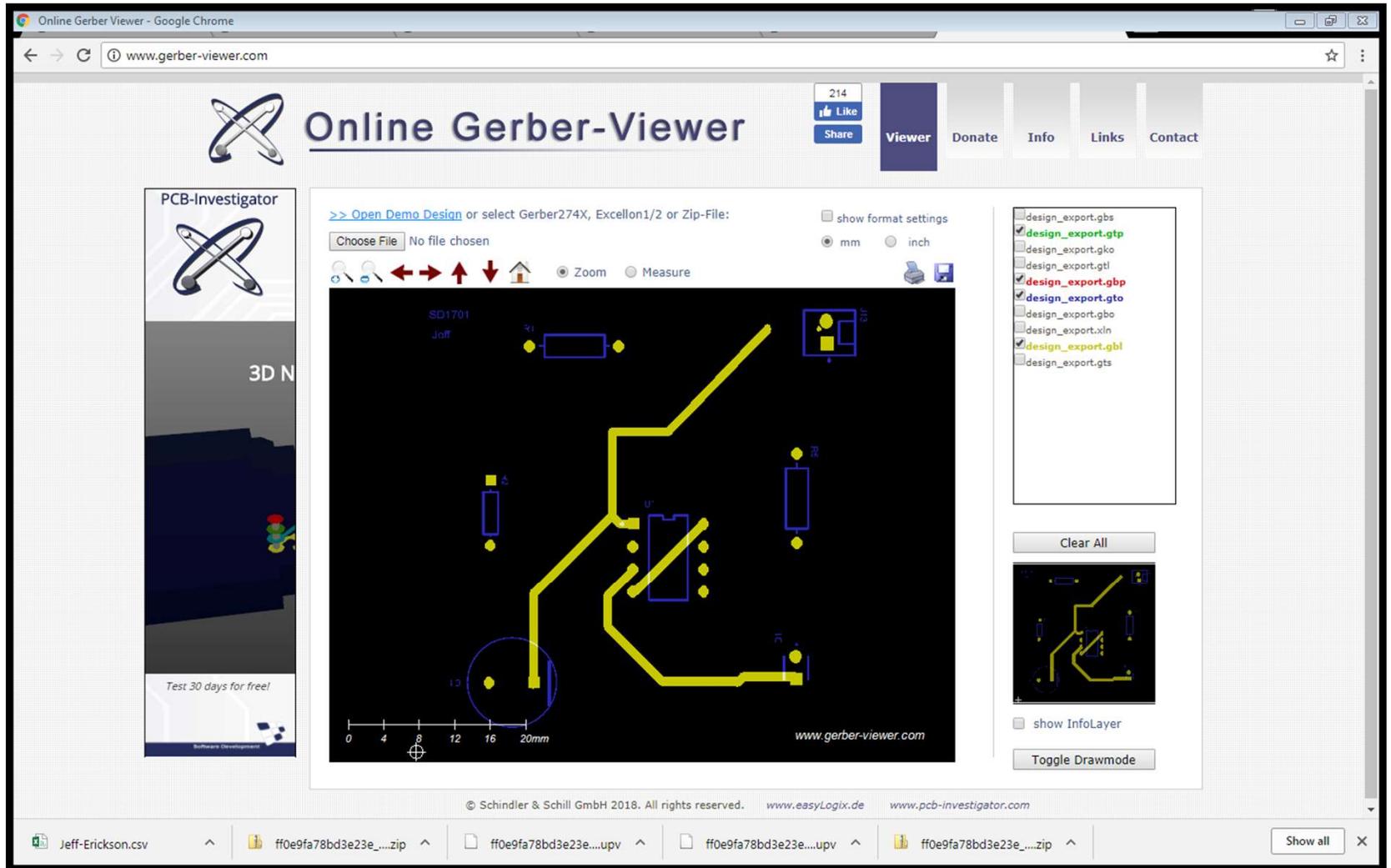
show InfoLayer

Toggle Drawmode

*"Online Gerber Viewer" integrated in your local company intranet?
Contact us: info@easylogix.de*

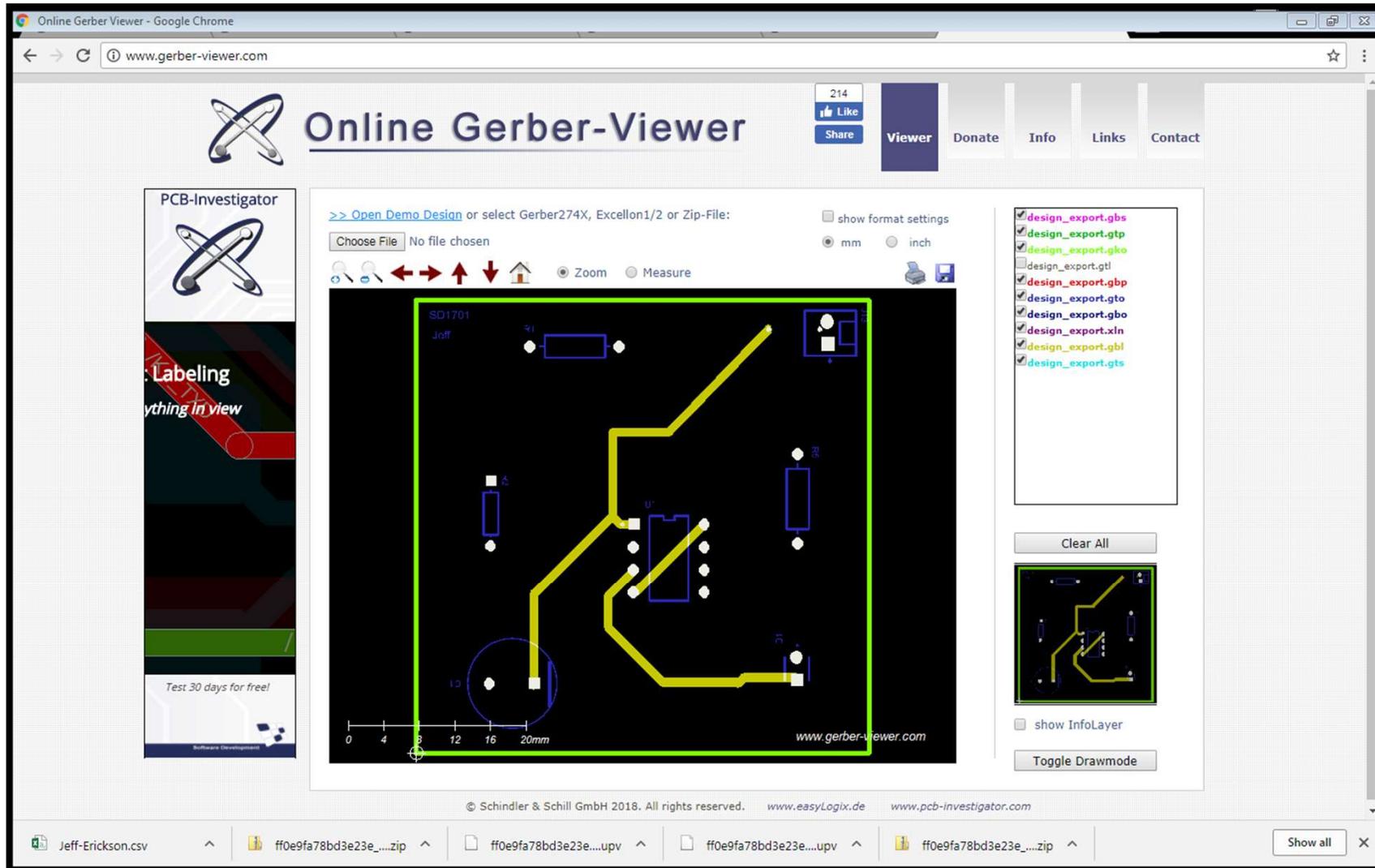
PCB Investigator
Professional CAD/CAM Station - Try it now for free!

This is one of the layers that was downloaded from Upverter files



Shows full PCB with Traces

If you like what you see, your PCB files are ready to order.... Go to.....



After looking at your files using the gerber-viewer.com website or similar, they need to be OK'd by Dr. Maassel or the TA or myself to make sure that all is ok for ordering.

These next slides show how to order with OshPark.com , It works well as you will see an instant picture of what your actually creating.

ALL emails/orders must have the SD401-F19-XX on it. Nothing will be approved with it.

Slide 55

JE1 After looking at your files in the
Jeffrey Erickson, 1/30/2018

JE2 Jeffrey Erickson, 9/4/2019

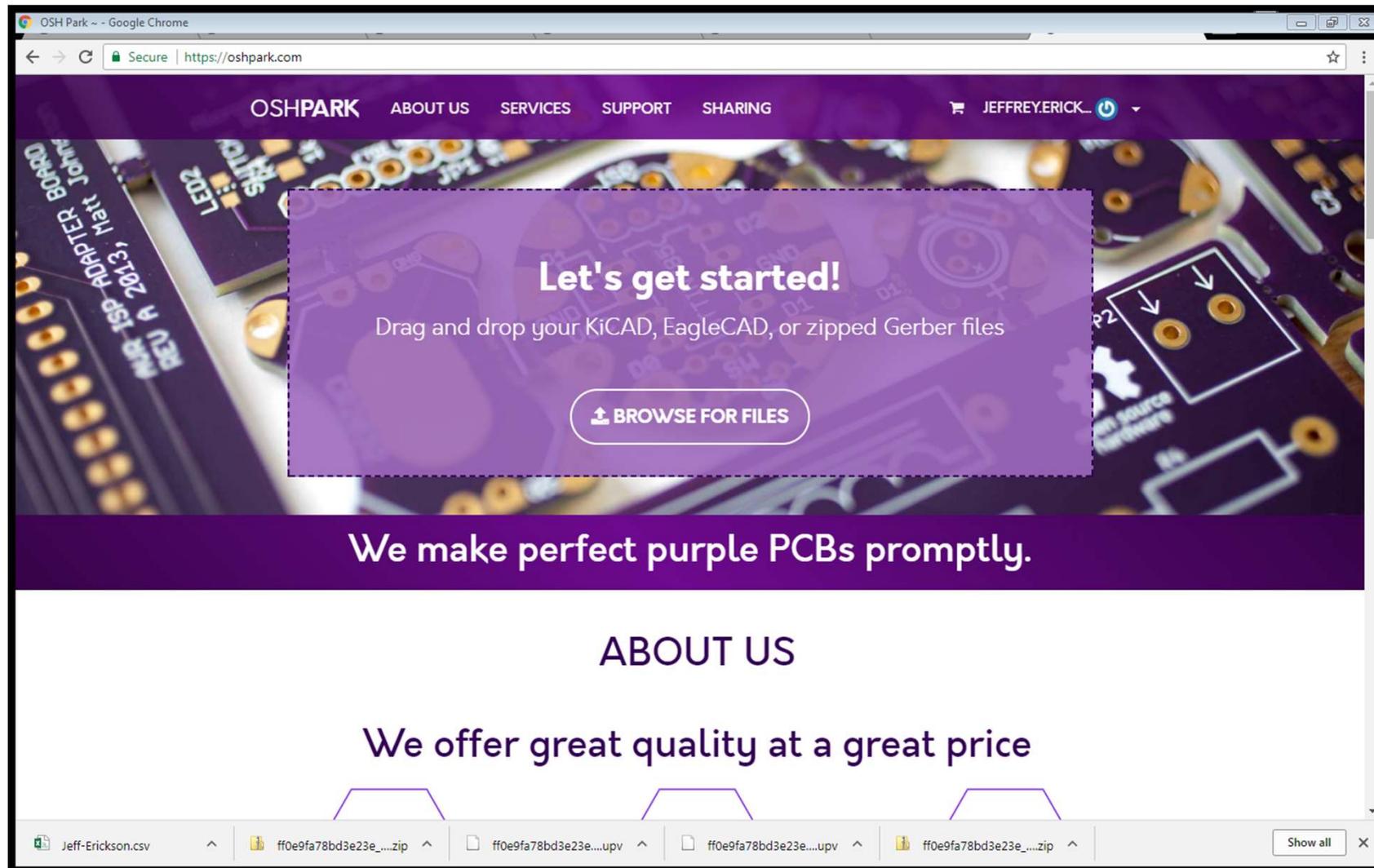
ALL orders/and emails must have this format shown.

SD401-F19-XX for Senior Design ECE401, Fall of 2019 Semester, Group number XX.

This to be included on Parts orders, PCB orders and emails.

SD401 Spring 18 Groups 1-20- Osh Park orders						
Group#	Date Orde	Date Received	PO#	Osh Park order#		
SD401-18-01	4/16/2018	4/27/2018	180103JE	bHH8iyjm		\$30.40
SD401-18-02	4/4/2018	4/11/2018	180079JE	gnaJG8Ja		\$19.65
SD401-18-03	4/17/2018	4/23/2018	180121JE	YufN5cA5		\$20.30
SD401-18-04	4/16/2018	4/23/2018	180126JE	rJj8SqN4		\$10.20
SD401-18-05	4/12/2018	4/24/2018	180091JE	qzDthznN		\$20.30
SD401-18-07	4/16/2018	4/24/2018	180120JE	boArQtkm		\$17.70
SD401-18-08	4/16/2018	4/24/2018	180120JE	dgEsPBY6		\$20.30
SD401-18-09	4/9/2018	4/17/2018	180080JE	isVQGUy8		\$20.30
SD401-18-10	4/16/2018	4/24/2018	180100JE	MgoFhqpt		\$20.30
SD401-18-11	4/16/2018	4/27/2018	180099JE	owJxcjG6		\$20.30
SD401-18-12	4/16/2018	4/24/2018	180101JE	mqWAShw		\$20.30
SD401-18-13	4/16/2018	4/24/2018	180102JE	pUZGrgrY		\$20.30
SD401-18-14	4/13/2018	4/25/2018	180096JE	G7WMurUz		\$20.30
SD401-18-15						\$0.00
SD401-18-16	4/13/2018	4/25/2018	180093JE	oPivQfVu		\$20.30
SD401-18-17	4/11/2018	4/23/2018	180086JE	m8qjhBVf		\$20.30
SD401-18-18	4/9/2018	4/24/2018	180083JE	J6gHSGSs		\$20.30
SD401-18-19	4/9/2018	4/23/2018	180081JE	QFQgykox		\$20.50
SD401-18-20	4/11/2018	4/23/2018	180087JE	Edqbxucq		\$20.30
SD401-18-21	4/16/2018	4/24/2018	180104JE	nekypMrN		\$20.30
SD401-18-22	4/16/2018	4/24/2018	180119JE	UHmE7FV8		\$20.60
SD401-18-18	4/9/2018	4/23/2018	180082JE	PBMsdzZU		\$20.30
SD401-18-06	4/13/2018	4/25/2018	180095JE	AzBKy78u		\$19.65
SD401-18-06	4/13/2018	4/25/2018	180095JE	dwyNrQMi		\$19.65
SD401-18-06	4/13/2018	4/25/2018	180095JE	MrRQYixQ		\$19.65

To Order: Go to oshpark.com create an account, Name and email address, DO NOT Pay for anything!



You will see this , it gives information about your board. IF this shows up and are agreeable with the price, scroll down and press Continue

The screenshot shows the OSH Park website interface. At the top, there is a navigation bar with the OSH Park logo and links for ABOUT US, SERVICES, SUPPORT, and SHARING. The user's name, JEFFREY.ERICK..., is displayed in the top right corner. The main heading is "About your board". Below this, it states: "We detected a 2 layer board of 2.02 x 2.02 inches (51.2 x 51.2mm) 3 boards will cost \$20.30". There are input fields for "Board name" (containing "ff0e9fa78bd3e23e_15172611460000_gerber (1)") and "Description" (with a placeholder "Enter a short description of your project"). A "Notes" section contains an information icon and the heading "Processing information", followed by a list of processing details. A warning icon and heading "Warning (non-critical)" are also present, with a note that the project does not contain a bottom silk screen. On the right side, there are two circuit board layout images: the top one is labeled "Top" and the bottom one is labeled "Bottom". The browser's address bar shows the URL "https://oshpark.com/uploads/2f8lymUS". The bottom of the screen shows a file explorer with several files related to the project.

OSHPARK ABOUT US SERVICES SUPPORT SHARING JEFFREY.ERICK...

About your board

We detected a 2 layer board of 2.02 x 2.02 inches (51.2 x 51.2mm)
3 boards will cost \$20.30

Board name
ff0e9fa78bd3e23e_15172611460000_gerber (1)

Description
Enter a short description of your project

Notes

Processing information

- Processing ff0e9fa78bd3e23e_15172611460000_gerber (1).zip as Upverter ZIP file.
- Removed empty file "design_export.gtp".
- Removed empty file "design_export.gbp".
- Removed empty file "design_export.gbo".
- 2 layer board of 2.02x2.02 inches.

Warning (non-critical)

- Your project doesn't contain a bottom silk screen.

Top

Bottom

Jeff-Erickson.csv ff0e9fa78bd3e23e_...zip ff0e9fa78bd3e23e_...upv ff0e9fa78bd3e23e_...upv ff0e9fa78bd3e23e_...zip Show all X

Now you can VERIFY all details of your board.

Do not purchase/ files are emailed to Purchase – Jeffrey.Erickson@ndsu.edu

OSHPARK ABOUT US SERVICES SUPPORT SHARING JEFFREY.ERICK...

Verify your design

Board Top

This shows the final manufactured board as if you held it in your hand.

Your design should show gold copper, purple mask, white silk, black drills, and the board outline.

Internal cutouts are indicated by a black outline but are not filled in.

If the image here is entirely white, you'll want to find and fix any gaps in the board outline.

There should be no dimension or measurement ruler

Board Bottom

This shows the final manufactured board as if

Jeff-Erickson.csv ff0e9fa78bd3e23e...zip ff0e9fa78bd3e23e...upv ff0e9fa78bd3e23e...upv ff0e9fa78bd3e23e...upv Show all



This is the final- but DO NOT ORDER unless it is for yourself- send the files to Jeffrey.Erickson@ndsu.edu

The screenshot shows a web browser window with the URL <https://oshpark.com/orders/oGfqZuub>. The page header includes the OSH Park logo and navigation links: ABOUT US, SERVICES, SUPPORT, and SHARING. The user's name, JEFFREY.ERICKSON, is displayed in the top right corner. A notification banner states, "Your boards have been shipped. [Track here.](#)"

Below the notification, two images are shown: a schematic diagram of a PCB on the left and a photograph of the physical board on the right. The schematic includes components labeled SW1, R1, R2, R3, R4, R5, D1, D2, D3, D4, D5, and BR1. The board number is identified as 50481-P17-05.

3 boards at \$20.10 per batch of three	\$20.10
Sub total	\$20.10
USPS - Free Shipping	\$0.00
TOTAL (paid)	\$20.10

The shipping address is listed as:

Shipping Address
Jeff Erickson
NDSU Electrical & Computer Eng
NDSU Dept 2480
PO Box 6050
Fargo , ND , 58108
United States

An "Order Receipt" button is located at the bottom right of the page.

The check mark says it is a Verified part. This is required to transfer to the PCB Design

The screenshot displays the Upverter web interface for a schematic design. The browser address bar shows the URL: <https://tools.upverter.com/eda/#tool=schematic.designId=54aa409ddd2cf082>. The interface includes a top navigation bar with tabs for SYSTEM, SCHEMATIC, PCB LAYOUT, CONSTRAINTS, and 3D MODEL. A sidebar on the right contains a search bar and various tool panels like History, Concierge, Services, Scripts, Property Inspector, Constraints (28 violations), Net List, Parts List, and Issues. The main workspace shows a schematic of the ATmega328-PU microcontroller with its pinout and a checkmark indicating it is a verified part.

U2

- AREF
- AVCC
- VCC
- (PCINT0/CLKO/ICP1)PB0
- PB1(OC1A/PCINT1)
- PB2(SS/OC1B/PCINT2)
- PB3(MOSI/OC2A/PCINT3)
- PB4(MISO/PCINT4)
- PB5(SCK/PCINT5)
- (PCINT8/XTAL1/TOSC1)PB6
- (PCINT7/XTAL2/TOSC2)PB7
- PC8(ADC0/PCINT8)
- PC1(ADC1/PCINT9)
- PC2(ADC2/PCINT10)
- PC3(ADC3/PCINT11)
- PC4(ADC4/SDA/PCINT12)
- PC5(ADC5/SCL/PCINT13)
- (PCINT14/RESET)PC6
- ATmega328-PU
- (PCINT16/RXD)PD0
- (PCINT17/TXD)PD1
- (PCINT18/INT0)PD2
- (PCINT19/OC2B/INT1)PD3
- (PCINT20/CKT0)PD4
- (PCINT21/OC0B/T1)PD5
- (PCINT22/OC0A/AIN0)PD6
- (PCINT23/AIN1)PD7
- GND
- GND

3.14 Dark Theme + X : -660 Y : -220 Pin names: off Zoom on scroll: on Zoom: 100%

Add some components, such as LED's and current limiting resistors

The screenshot shows the Upverter web-based schematic editor interface. The main workspace displays a schematic diagram of an ATmega328-PU microcontroller (U2) with five LEDs (D1-D5) and resistors (R1-R5) connected to its pins. The microcontroller's pinout is as follows:

- AREF
- AVCC
- VCC
- (PCINT0/CLKO/ICP1)PB0
- PB1(OC1A/PCINT1)
- PB2(SS/OC1B/PCINT2)
- PB3(MOSI/OC2A/PCINT3)
- PB4(MISO/PCINT4)
- PB5(SCK/PCINT5)
- (PCINT6/XTAL1/TOSC1)PB6
- (PCINT7/XTAL2/TOSC2)PB7
- PC0(ADC0/PCINT8)
- PC1(ADC1/PCINT9)
- PC2(ADC2/PCINT10)
- PC3(ADC3/PCINT11)
- PC4(ADC4/SDA/PCINT12)
- PC5(ADC5/SCL/PCINT13)
- (PCINT14/RESET)PC6
- ATmega328-PU
- (PCINT16/RXD)PD0
- (PCINT17/TXD)PD1
- (PCINT18/INT0)PD2
- (PCINT19/OC2B/INT1)PD3
- (PCINT20/CKT0)PD4
- (PCINT21/OC0B/T1)PD5
- (PCINT22/OC0A/AIN0)PD6
- (PCINT23/AIN1)PD7
- GND
- GND

The components are connected as follows:

- R1 (5K) is connected to PB1 and D1 (LED).
- R2 (5K) is connected to PB2 and D2 (LED).
- R3 (5K) is connected to PB3 and D3 (LED).
- R4 (5K) is connected to PB4 and D4 (LED).
- R5 (5K) is connected to PB5 and D5 (LED).

The Upverter interface includes a top navigation bar with tabs for SYSTEM, SCHEMATIC, PCB LAYOUT, CONSTRAINTS, and 3D MODEL. A right-hand sidebar contains a search bar and a list of tools: History, Concierge, Services, Scripts, Property Inspector, Constraints (38 violations), Net List, Parts List, and Issues. The bottom status bar shows the version (3.14), theme (Dark Theme), coordinates (X: -710, Y: -30), and zoom level (100%).

Insert a battery, in this case BT1, change the 3.3 Volt to 9V

The screenshot displays the Upverter web-based schematic design tool. The main workspace shows a schematic diagram of an ATmega328-PU microcontroller (U2) connected to a 3.3V battery (BT1) and four LEDs (D1, D2, D3, D4) through resistors (R1, R2, R3, R4). The microcontroller's pins are labeled as follows:

- AREF
- AVCC
- VCC
- (PCINT0/CLKO/ICP1)/PB0
- PB1(OA1/PCINT1)
- PB2(SS/OA1B/PCINT2)
- PB3(MISO/OA2A/PCINT3)
- PB4(MISO/PCINT4)
- PB5(SCK/PCINT5)
- (PCINT6/XTAL1/TOSC1)/PB6
- (PCINT7/XTAL2/TOSC2)/PB7
- (PCINT8/PCINT8)
- PC1(ADC1/PCINT9)
- PC2(ADC2/PCINT10)
- PC3(ADC3/PCINT11)
- PC4(ADC4/SDA/PCINT12)
- PC5(ADC5/SCL/PCINT13)
- (PCINT14/RESET)/PC6
- ATmega328-PU
- (PCINT16/RXD)/PD0
- (PCINT17/TXD)/PD1
- (PCINT18/INT0)/PD2
- (PCINT19/OA2B/INT1)/PD3
- (PCINT20/ACKT0)/PD4
- (PCINT21/OA0/INT1)/PD5
- (PCINT22/OA0A/AIN0)/PD6
- (PCINT23/AIN1)/PD7
- GND
- GND

The interface includes a top navigation bar with tabs for SYSTEM, SCHEMATIC, PCB LAYOUT, CONSTRAINTS, and 3D MODEL. A right sidebar contains a search bar and navigation options: History, Concierge, Services, Scripts, Property Inspector, Constraints (39 violations), Net List, Parts List, and Issues. The bottom status bar shows the zoom level at 100% and the dark theme is active.

Add your grounds

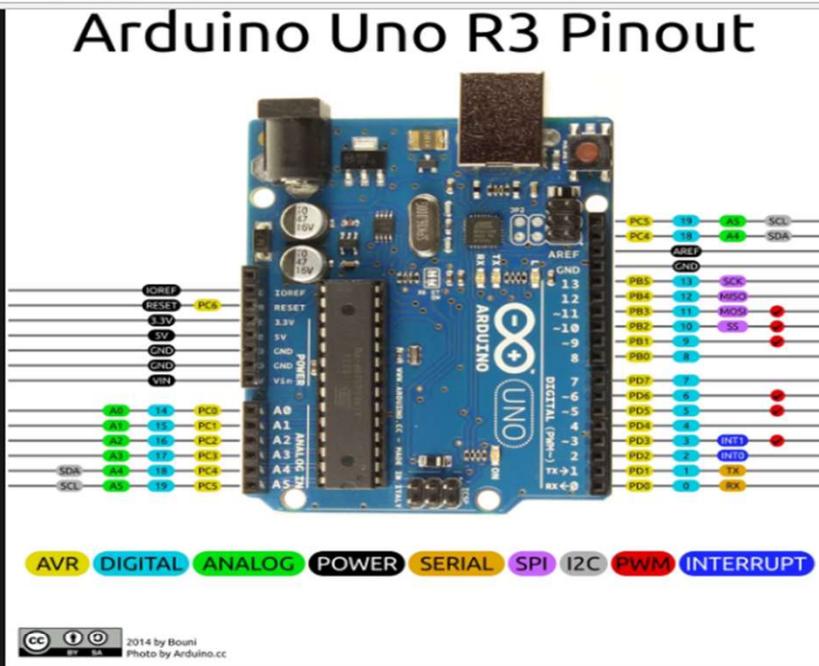
The screenshot displays the Upverter EDA tool interface. At the top, the browser address bar shows the URL: <https://tools.upverter.com/eda/#tool=schematic,designId=54aa409ddd2cf082>. The Upverter logo and navigation tabs (SYSTEM, SCHEMATIC, PCB LAYOUT, CONSTRAINTS, 3D MODEL) are visible. A notification bar asks for a recommendation. The main workspace shows a schematic diagram of an ATmega328-PU microcontroller (U2) with various pins connected to components: a 3.3V battery (BT1), resistors (R1, R2, R3, R4, R5), and LEDs (D1, D2, D3, D4, D5). The pin list for U2 includes: AREF, AVCC, VCC, (PCINT0/CLKO/CP1)PB0, PB1(OC1A/PCINT1), PB2(SS/OC1B/PCINT2), PB3(MOSI/OC2A/PCINT3), PB4(MISO/PCINT4), PB5(SCK/PCINT5), (PCINT6/XTAL1/TOSC1)PB6, (PCINT7/XTAL2/TOSC2)PB7, PC0(ADC0/PCINT8), PC1(ADC1/PCINT9), PC2(ADC2/PCINT10), PC3(ADC3/PCINT11), PC4(ADC4/SDA/PCINT12), PC5(ADC5/SCL/PCINT13), (PCINT14/RESET)PC6, (PCINT16/RXD)PD0, (PCINT17/TXD)PD1, (PCINT18/INT0)PD2, (PCINT19/OC2B/INT1)PD3, (PCINT20/XCK/T0)PD4, (PCINT21/OC0B/T1)PD5, (PCINT22/OC0A/AIN0)PD6, and (PCINT23/AIN1)PD7. The right sidebar contains a search bar and a list of tools: History, Concierge, Services, Scripts, Property Inspector, Constraints (39 violations), Net List, Parts List, and Issues. The bottom status bar shows: 3.14, Dark Theme, X: -660, Y: 270, Pin names: off, Zoom on scroll: on, Zoom: 100%.

You will need Data sheets handy, indicating Pin Lay outs, for Vcc Gnds, Input and output pins

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Arduino Uno R3 Pinout



AVR DIGITAL ANALOG POWER SERIAL SPI I2C PWM INTERRUPT

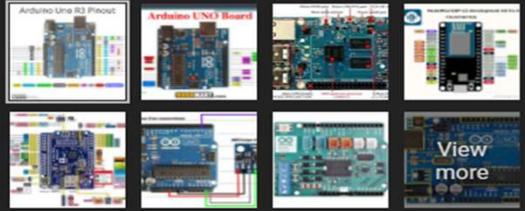
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Understanding Arduino UNO Hardware ...

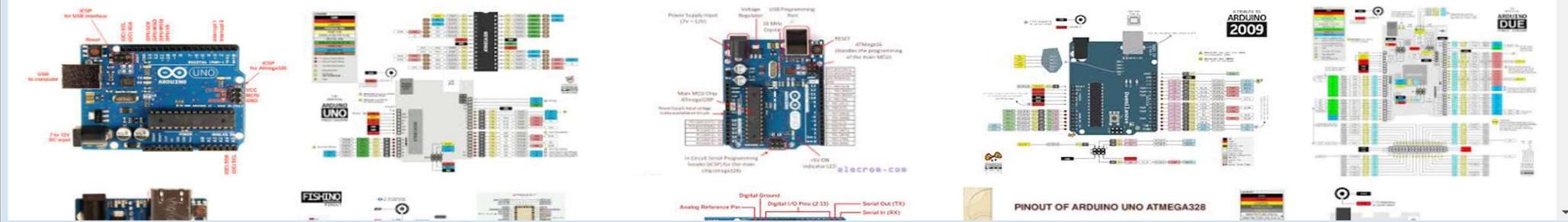
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Insert a Voltage Regulator such as an LM7805 5 Volt Regulator

The screenshot displays the Upverter web interface for a schematic design. The browser address bar shows the URL: <https://tools.upverter.com/eda/#tool=schematic.designId=54aa409ddd2cf082>. The interface includes a top navigation bar with tabs for SYSTEM, SCHEMATIC, PCB LAYOUT, CONSTRAINTS, and 3D MODEL. A sidebar on the right contains a search bar and a list of tools: History, Concierge, Services, Scripts, Property Inspector, Constraints (42 violations), Net List, Parts List, and Issues. The main workspace shows a schematic diagram with the following components and connections:

- LM7805 (U1):** A 5V voltage regulator with VIN connected to a 3.3V battery (BT1) and VOUT connected to the AVCC pin of the ATmega328-PU.
- ATmega328-PU (U2):** A microcontroller with various pins connected to LEDs and resistors:
 - Pin 1 (PB0) to LED D1 through resistor R1 (5K).
 - Pin 2 (PB1) to LED D2 through resistor R2 (5K).
 - Pin 4 (PB3) to LED D3 through resistor R3 (5K).
 - Pin 5 (PB4) to LED D4 through resistor R4 (5K).
- LM7805 (U3):** A second 5V voltage regulator with VIN connected to a 3.3V battery (BT1) and VOUT connected to the VCC pin of the ATmega328-PU.
- Resistors (R1-R5):** All resistors are 5K Ohm.
- LEDs (D1-D4):** Four LEDs connected to the microcontroller pins.
- Batteries (BT1):** Two 3.3V batteries providing power to the regulators.

The Connections between components, grounds, power ,etc. are called Nets If highlighted in Yellow there is an issue and must be corrected. Usually a naming issue.

The image shows a screenshot of the Upverter schematic editor interface. The main workspace displays a circuit diagram for an ATmega328-PU microcontroller. The circuit includes an LM7805 voltage regulator powered by a 3.3V battery, three push buttons (SW8, SW9, SW10) with 5k resistors (R7, R8, R9), and four LEDs (D1, D2, D3, D4) with 5k resistors (R1, R2, R3, R4). The ATmega328-PU pin headers are labeled with various functions like AREF, AVCC, VCC, and various I/O pins. Several nets in the diagram are highlighted in yellow, indicating naming issues. On the right side, a 'Net List' panel is open, showing a list of these highlighted nets with their names and status (ON). The net list includes:

- (?6 - 1) (BT1 - 1) ON
- BT1-CATHODE ?6-VIN ON
- (?6 - 2) (R5 - 1) (SW... ON
- SW9-LEFT SW10-LEFT R5-1 U2... ON
- (D4 - 2) (R4 - 2) ON

At the bottom of the interface, there is a status bar with the following information: 3.14, Dark Theme, X: -680, Y: 150, Pin names: off, Zoom on scroll: on, Zoom: 100%.

Any questions please stop by, but remember to use the Tutorials and Users Manual on Upverter