

ORDER LEPTON BLCD SIMPLEFOC BOARD FROM JLCPCB.COM

This will show step by step ordering of the ultra-low cost Lepton board v2.0.

Prerequisites: JLCPCB account. Please go to

<https://jlpcb.com/>

and create a new account if you do not have one.

Let's begin.

Create a GERBER file.

https://oshwlab.com/cost.co/20220903_bldc_se3082g

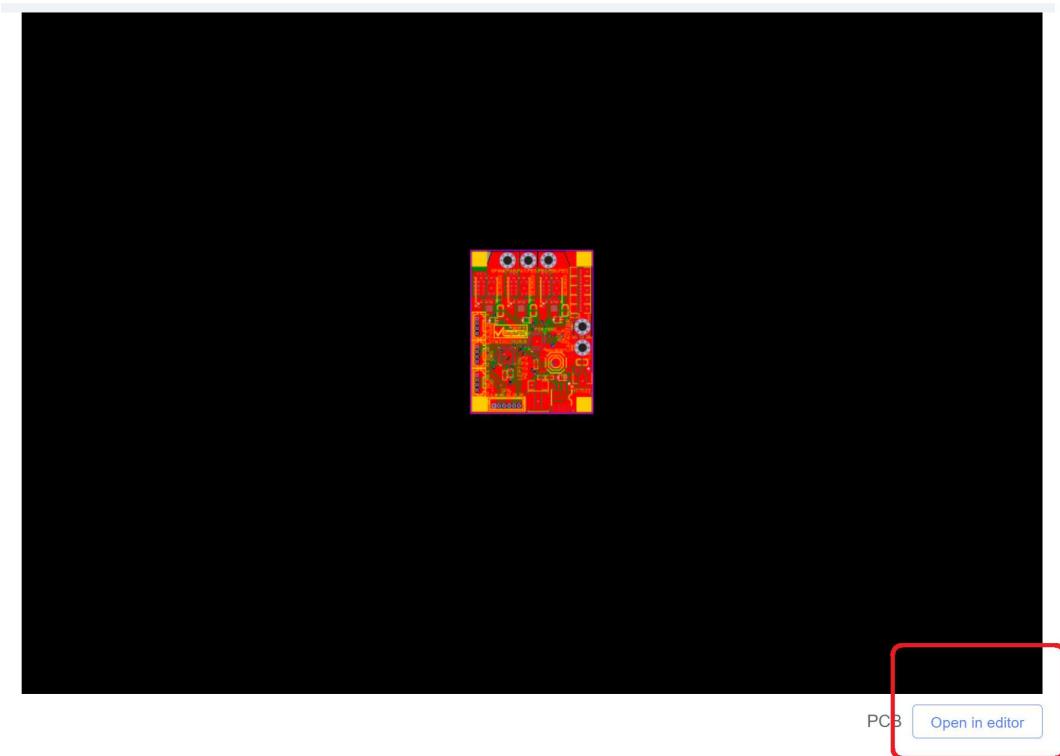
or

https://oshwlab.com/cost.co/20220903_bldc_se3082g_copy

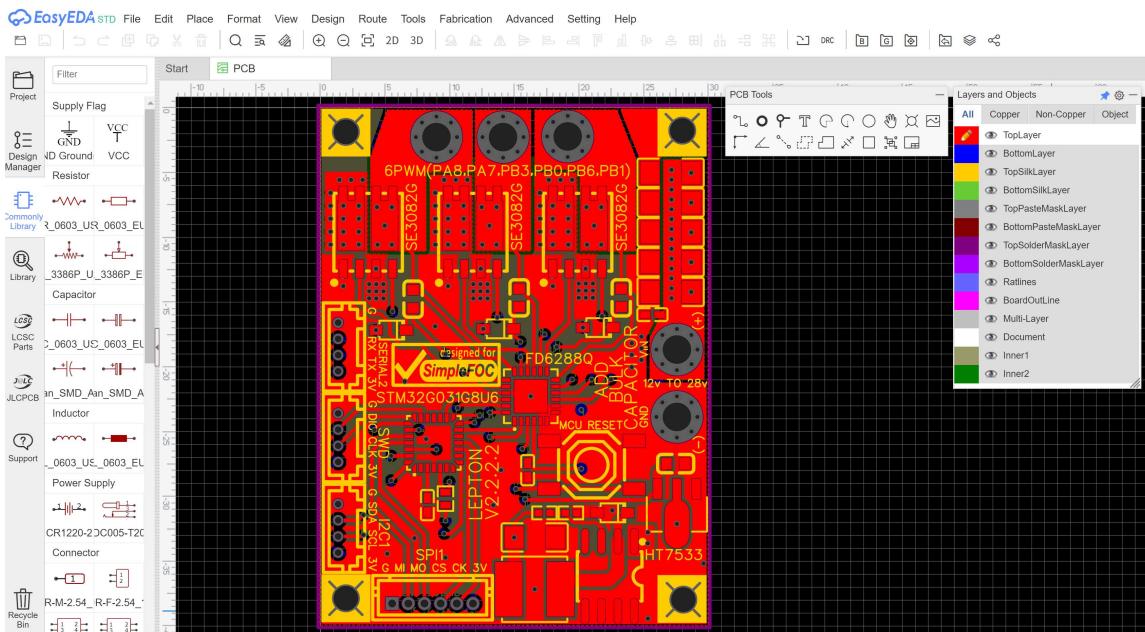
Click on one of the links above. One is for the 2-layer, another is for the higher current 4-layer. I would recommend to click on the 4-layer. The 2-layer is the absolute bare-bone basic board, which may be a little cheaper and faster to manufacture but can carry less current. Functionally they are the same. This will take you to the following page:

The screenshot shows the OSHWLab website interface. At the top, there is a navigation bar with links for Home, Explore, Article, Post, Forum, a search bar, and buttons for Share Project, Login | Register, and Editor Open. Below the navigation, the page title is "Lepton v2 BLDC SimpleFOC Driver 4-Layer". The main content area features a photograph of the green printed circuit board with various components labeled: SERIAL, SWD, STM32G031 64MHz, I2C, FORTIOR SPWM DRIVER, and LDO 3V. To the right of the image, there is a brief profile: "Std edition", "Lepton v2 BLDC SimpleFOC Driver 4-Layer", "Arduino", "STM32", "Motor Drive Module", "Profile: Features: 30mm X 40mm 4-layer 30V / 80A (170A peak) H-bridge integrated MOSFETs. Fortior Driver STM32G031 / 64MHz MCU SPI, I2C, Serial and", "License: CERN Open Hardware License", "Project source: Cloned from Lepton v2 BLDC SimpleFOC Driver", and "Published Time:". On the far right, there is a user profile for "VALENTINE" with statistics: 0 Following, 18 Followers, 16 Likes, and buttons for "+ Follow" and "Send". A sidebar on the right contains links for "Description", "design drawing", "BOM", "Attachments", "Members", and "Comments".

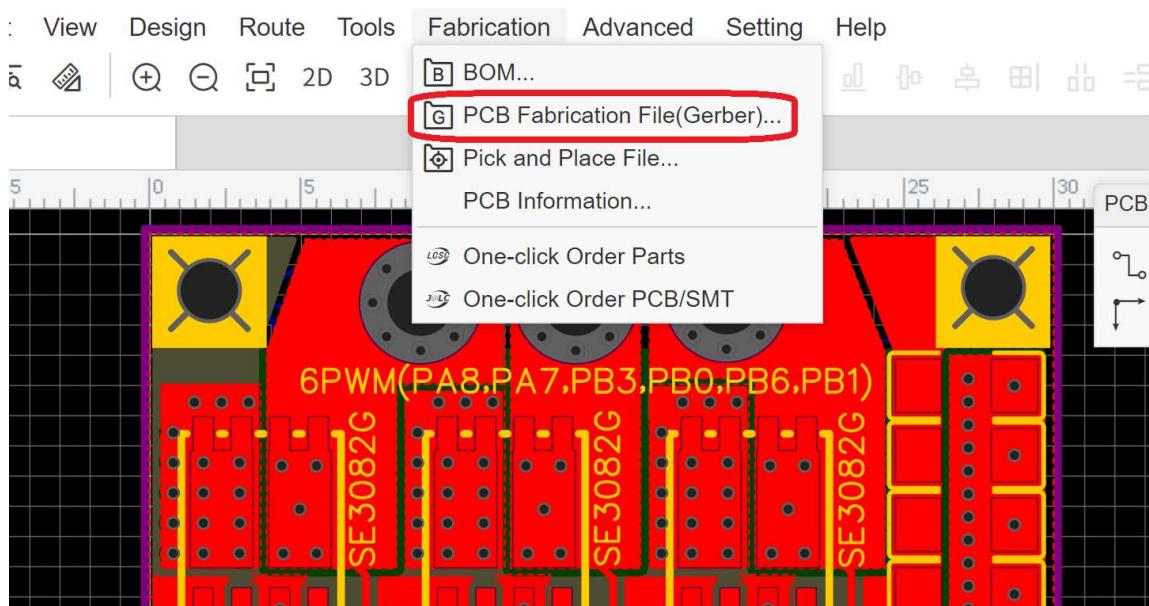
On that page, scroll down to the PCB and click on the following button:



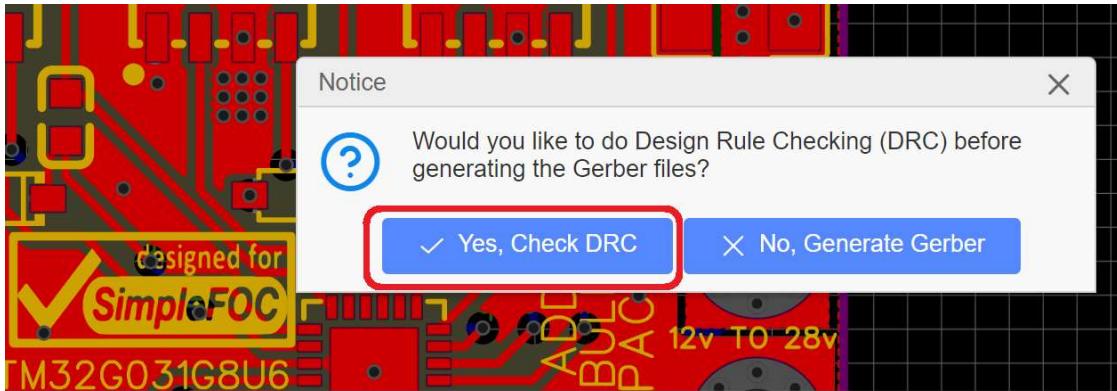
The schematics project will open in EasyEDA editor. The screen will look more or less like that:



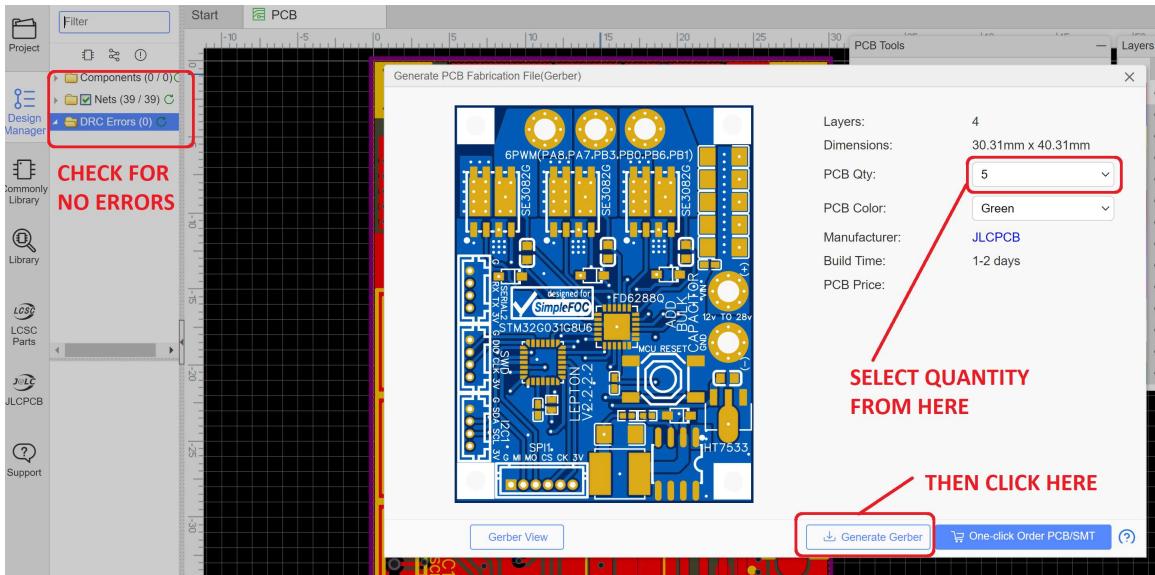
On that screen, open the Fabrication drop down and select PCB Fabrication.



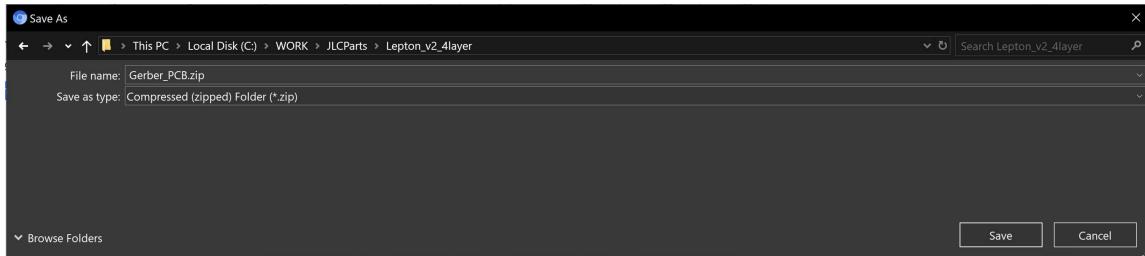
Click on Generate Gerber



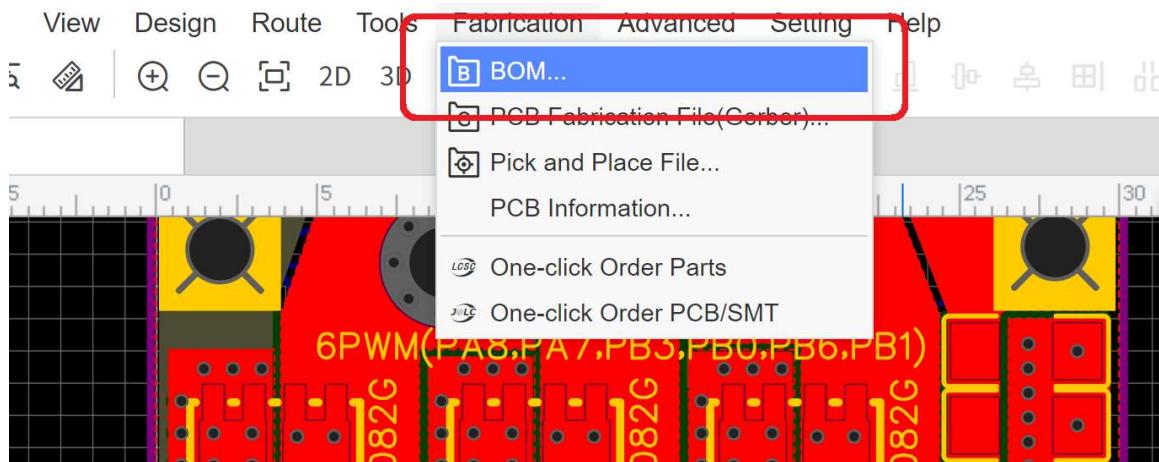
The following screen will open.



Click on Generate Gerber. Yes, I know, the JLC order system is not exactly what you call streamlined. Just close your eyes and go with the flow. Now open your eyes. Save the ZIP file locally in a directory. The file will be called Gerber_PCB.zip



Next, go back to the PCB viewer and select BOM.

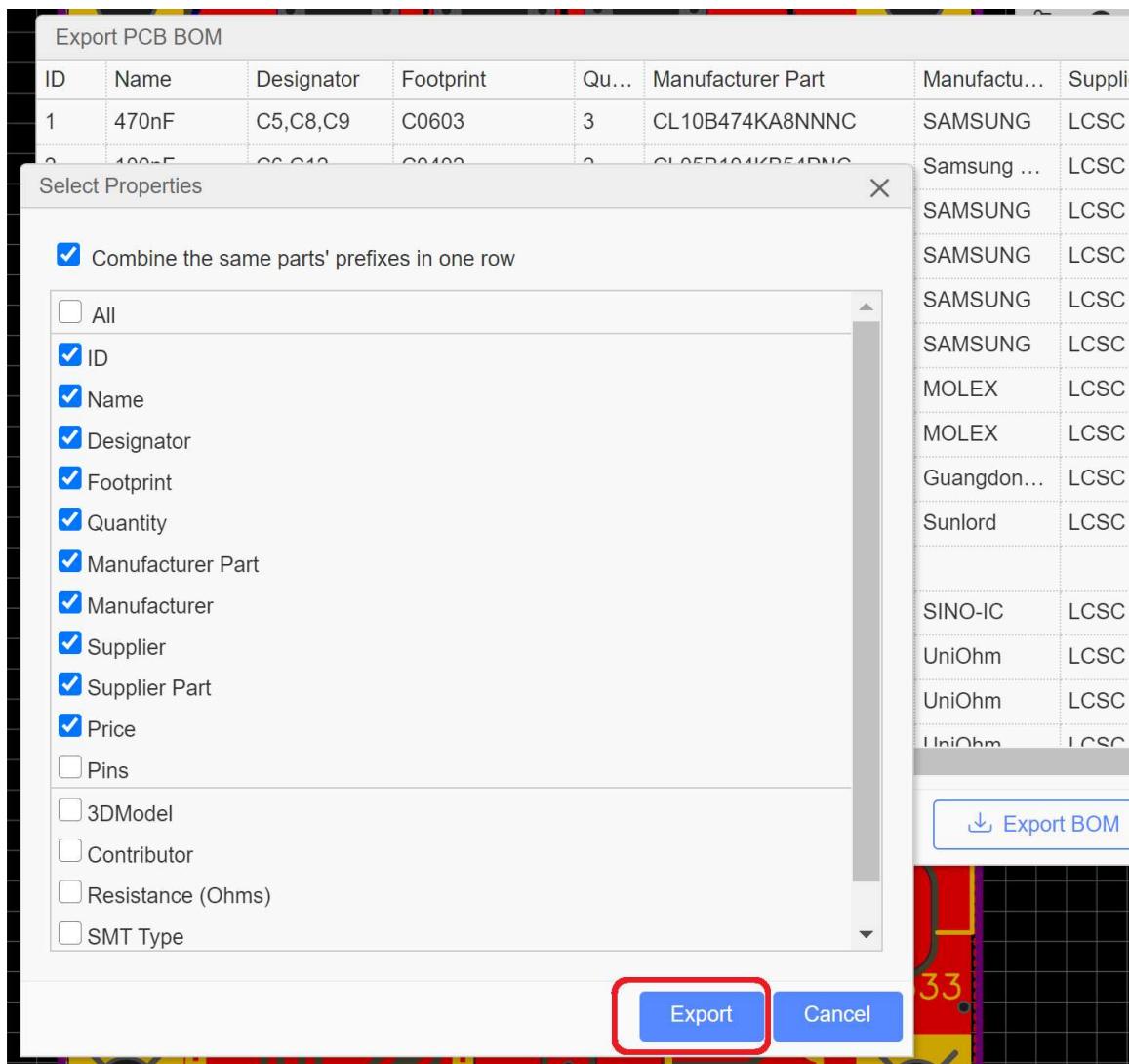


The following screen will show up. Click on Export BOM.

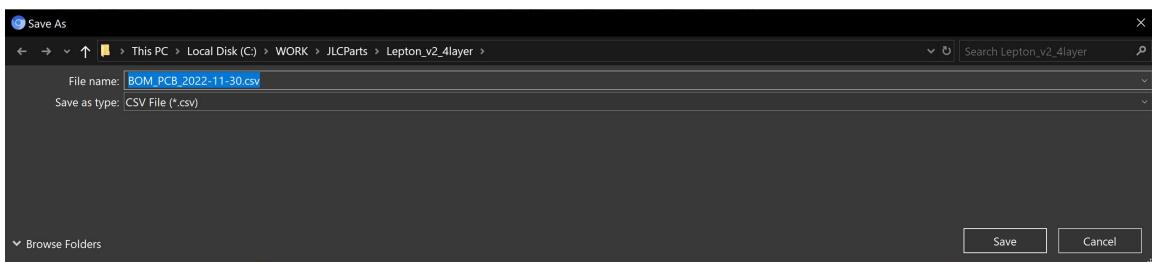
Export PCB BOM

ID	Name	Designator	Footprint	Qu...	Manufacturer Part	Manufactu...	Supplier	Supplier Part	Price
1	470nF	C5,C8,C9	C0603	3	CL10B474KA8NNNC	SAMSUNG	LCSC	C1623	<button>Assign LCSC Part#</button> 0.007
2	100nF	C6,C12	C0402	2	CL05B104KB54PNC	Samsung ...	LCSC	C307331	<button>Assign LCSC Part#</button> 0.007
3	22uF	C7	C1206	1	CL31A226KAHNNNE	SAMSUNG	LCSC	C12891	<button>Assign LCSC Part#</button> 0.058
4	10uF	C1,C2,C3,...	C1206	5	CL31A106KBHNNNE	SAMSUNG	LCSC	C13585	<button>Assign LCSC Part#</button> 0.035
5	22uF	C11	C0603	1	CL10A226MQ8NRNC	SAMSUNG	LCSC	C59461	<button>Assign LCSC Part#</button> 0.005
6	100nF	C13	C0402_NEW	1	CL05B104KO5NNNC	SAMSUNG	LCSC	C1525	<button>Assign LCSC Part#</button> 0.001
7	530470610	CN2	CONN-TH_6P...	1	530470610	MOLEX	LCSC	C385109	<button>Assign LCSC Part#</button> 0.171
8	530470410	CN1,CN3,...	CONN-TH_53...	3	530470410	MOLEX	LCSC	C504989	<button>Assign LCSC Part#</button> 0.086
9	1N5819WS	D3,D4,D6,D7	SOD-323_L1....	4	1N5819WS	Guangdon...	LCSC	C191023	<button>Assign LCSC Part#</button> 0.016
10	100uH	L2	IND-SMD_L5....	1	SWPA5040S101MT	Sunlord	LCSC	C88132	<button>Assign LCSC Part#</button> 0.07
11	M2 PLATE...	M1,M2,M3...	M2 PLATED H...	5					<button>Assign LCSC Part#</button>
12	SE3082G	Q1,Q2,Q3	DFN-8_L5.5-...	3	SE3082G	SINO-IC	LCSC	C238670	<button>Assign LCSC Part#</button> 0.336
13	1kΩ	R1	R0402	1	0402WGF1001TCE	UniOhm	LCSC	C11702	<button>Assign LCSC Part#</button> 0
14	8.2kΩ	R2	R0402	1	0402WGF8201TCE	UniOhm	LCSC	C25924	<button>Assign LCSC Part#</button> 0
15	10k	R12	R0402	1	0402WGF1002TCE	UniOhm	LCSC	C25744	<button>Assign LCSC Part#</button> 0.001

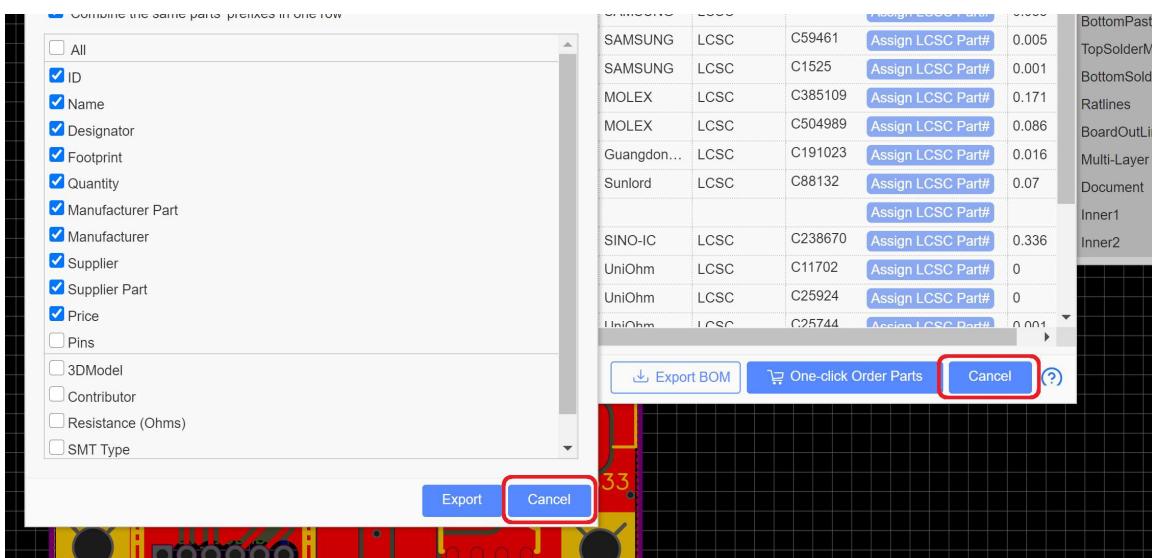
Another screen will open. Click Export. Save the file.



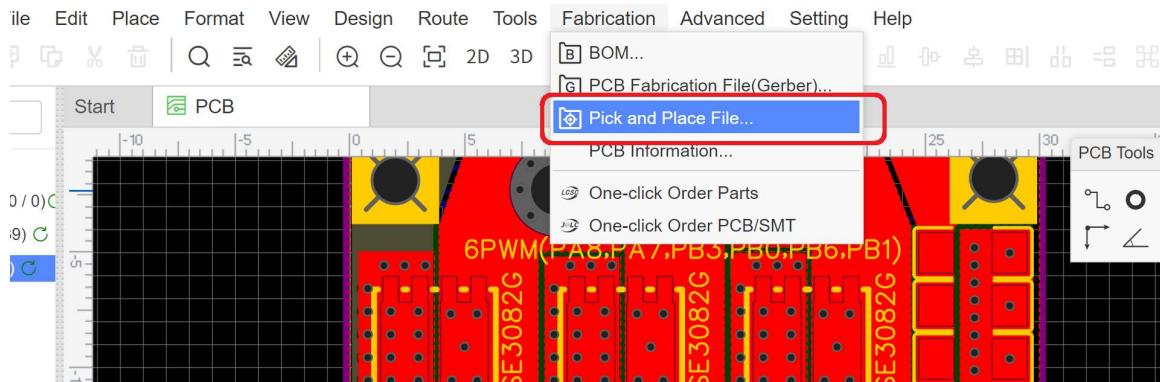
The file name will be something like BOM_PCB_2022-06-05.csv



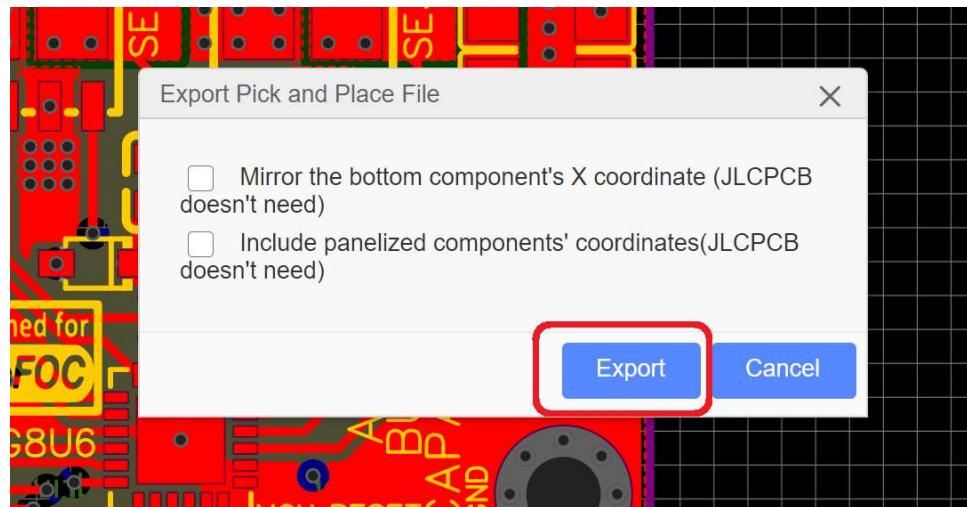
Next, Click on Cancel. When you export the BOM, the BOM order screen will not close, so you need to Cancel it. It's a bit confusing but c'est la vie.



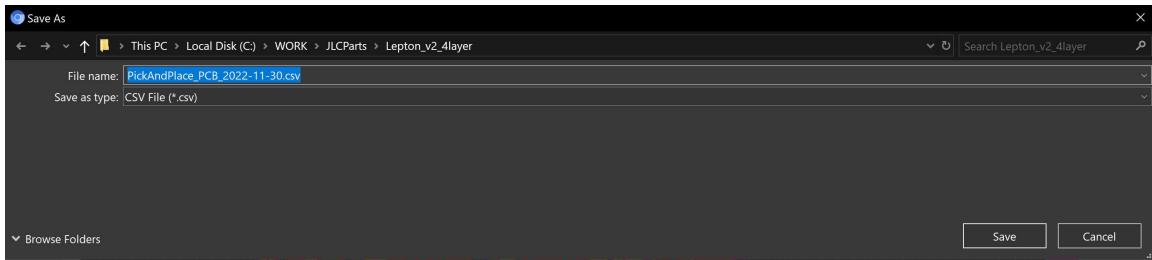
Go back to the main menu. Under Fabrication, select Pick and Place.



The following window will appear. Click on Export.



Save the file, the name will be something like PickAndPlace_PCB_2022-06-05.csv



At that point you have the Gerber, BOM and Pick and Place file (also called a PnP, or centroid file).

This PC > Local Disk (C:) > WORK > JLCParts > Lepton_v2_4layer			
Name	Date modified	Type	Size
BOM_PCB_2022-11-30.csv	11/30/2022 8:53 ...	CSV File	5 KB
Gerber_PCB.zip	11/30/2022 8:48 ...	Compressed (zipp...)	154 KB
PickAndPlace_PCB_2022-11-30.csv	11/30/2022 8:58 ...	CSV File	9 KB

You are ready to order. Log into your JLC account. Click on Order now.

Industrial 3D Printing, starting at \$1

SLA, MJF, SLM, FDM, SLS, Fast turnaround and high quality

Click on Add gerber file and import the Gerber ZIP file you created above.

J@LC JLCPCB

Why JLCPCB? Capabilities Support Resources

PCB SMT-Stencil

CLICK HERE AND IMPORT THE GERBER ZIP FILE

Add gerber file

Only accept zip or rar, Max 20 M. View example >
Instructions for ordering Upload History >>

Base Material FR-4 Aluminum

Layers 1 2 4 6

You will see a progress line indicator, which sometimes if JLC web site is very busy may not complete to 100%. No worry, just keep going. It's helpful, however, to wait to 100%.

J@LC JLCPCB

Why JLCPCB? Capabilities Support Resources

PCB SMT-Stencil 3D-Printing

Processing Gerber files...

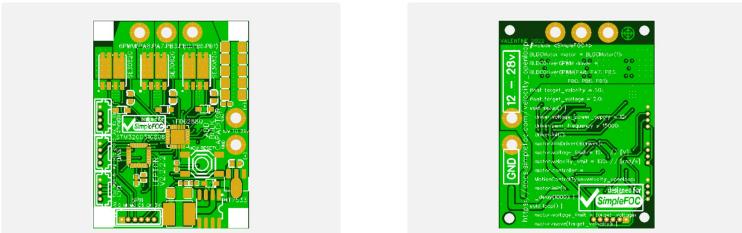
28%

Base Material FR-4 Aluminum

Layers 1 2 4 6

Dimensions 100 * 100 mm

At the end, if import is good, you will see your board. This is how your order will look like.

PCB	SMT-Stencil	3D-Printing	Charge Details
<p>Detected 4 layer board of 40.31x30.31mm(1.59x1.19 inches).</p> <p>Your upload has finished processing. Enter the project details below and we'll move on to checking all the individual layers to make sure that they're correct.</p> 			<p>Special Offer \$2.00</p> <p>Via Covering \$0.00</p> <p>Surface Finish \$0.00</p> <p>Build Time</p> <p>PCB: <input checked="" type="radio"/> 4 days \$0.00 <input type="radio"/> 3 days \$25.60 <input type="radio"/> 2 days \$28.60</p> <p>Calculated Price \$4.00 - \$2.00 Additional charges may apply for special cases</p> <p>Weight 0.13kg</p> <p>SAVE TO CART</p>

Now you need to select how many boards you want. The minimum is 5 PCB boards (with 2 boards SMD), the maximum is your imagination. Let's go for 10 PCB boards and 10 SMD.

[Back to Upload File](#)✓ Success, this file has been saved to your [File Manager](#)

Gerber Viewer

Base Material FR-4 Aluminum

Layers 1 2 4 6

Dimensions 20.32 * 20.32 mm

PCB Qty 5 10 15 20 25 30 50 CLICK HERE

Product Type 5 10 15 20 25 30 50 THEN SELECT 10 BOARDS

Different Design 75 100 125 150 200 250 300

Delivery Format 400 450 500 600 700 800 900

PCB Thickness 1000 1500 2000 2500 3000 3500 4000

Impedance 4500 5000 5500 6000 6500 7000 7500

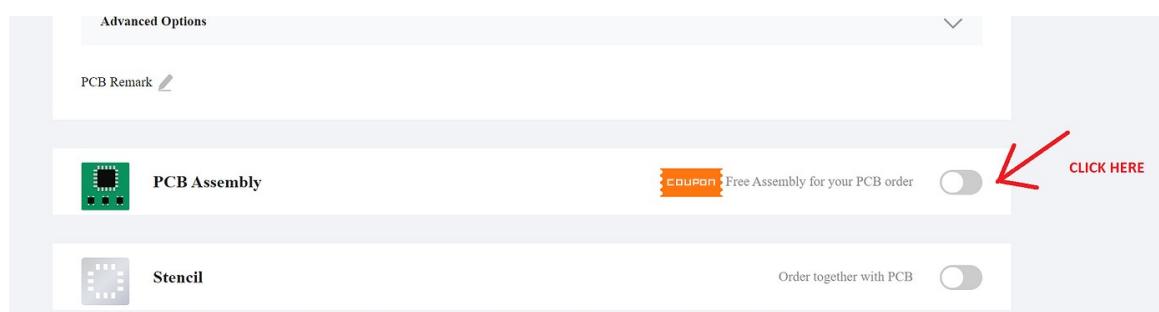
Layer stackup 8000 8500 9000 9500 10000 11000 12000

13000 14000 15000 16000 17000 18000 19000

25000 30000 40000 50000 60000 70000 80000

L3(Inner layer2) Select

Leave the rest of the options as is, do not touch it, and scroll all the way down, we need to select PCB assembly. Click on the PCB Assembly toggle button.



Your screen will change to this. Click on NEXT.

 **PCB Assembly**

 **COUPON** Free Assembly for your PCB order 



Assemble top side Assemble bottom side

PCBA Type: Economic Standard [What's the difference?](#)

Assembly Side: Top Side Bottom Side Both Sides

PCBA Qty: 10 [Change](#)

Tooling holes: Added by JLCPCB Added by Customer

Confirm Parts Placement: No Yes

I agree to the Terms and Conditions of JLCPCB SMT Service.

Confirm

Surface Finish: \$0.00

Economic PCBA Price

Setup Fee	\$8.00
Stencil	\$1.50
Components	-
Extended components fee	-
SMT Assembly	-
Hand-soldering labor fee	-
Manual Assembly	-

Build Time

PCB:	<input checked="" type="radio"/> 4 days	\$0.00
	<input type="radio"/> 3 days	\$25.60
	<input type="radio"/> 2 days	\$28.60

Assembly: 1-3 days 

Calculated Price **\$16.50**
Additional charges may apply for special cases

Weight: 0.20kg

NEXT

Shipping Estimate
Charge: Choose destination country first

The following screen will appear.

PCB  Upload BOM/CPL  Select Parts 

Add BOM File

Only accept XLS,XLSX,CSV

IMPORT BOM CSV FILE

[View Sample BOM](#)

Please help to select the correct usage description for your product. 

Not sure where to start? Check our [SMT FAQs page](#).

Tips: With EasyEDA, you can generate BOM/CPL files with a single click.

Add CPL File

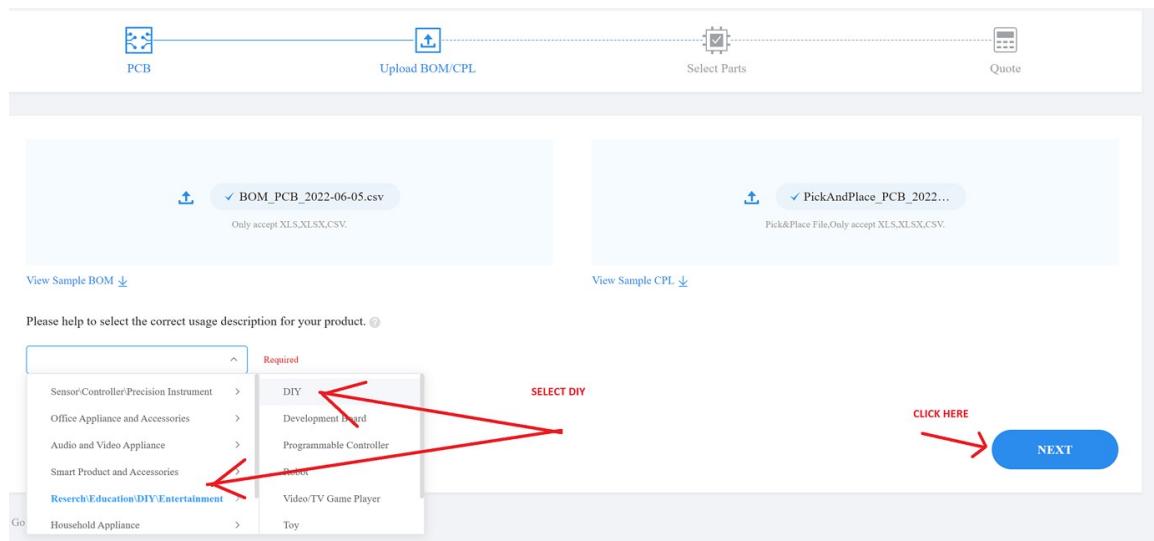
Pick&Place File, Only accept XLS,XLSX,CSV

IMPORT PnP CENTROID FILE

[View Sample CPL](#)

NEXT

On that screen, import the two CSV files you created above. Once you import them, the screen will change to this.



Select Research option, click on DIY, then click on NEXT. This will be the hardest part of the order, due to silicon shortages, you will have to replace some components with synonyms.

The screen will change to this.

Total 20 parts detected 19 Parts confirmed 1 parts not selected

Uploaded BOM Data			Review Matched Parts							
Top Designator	Name	Footprint	Matched Part Detail			Qty	Source	Lib Type	Total Cost	Select
C13	100nF	C0402_NEW	CL05B104K05NNNC 16V 100nF X7R ±10% 0402 Multi...	C1525		10	JLPCB	Basic	\$0.0090	<input checked="" type="checkbox"/>
C5,C8,C9	470nF	C0603	CL10B474KABNNNC 25V 470nF X7R ±10% 0603 Multi...	C1623		30	JLPCB	Basic	\$0.1800	<input checked="" type="checkbox"/>
R1	1kΩ	R0402	0402WGF1001TCE 62.5mW Thick Film Resistors 50...	C11702		10	JLPCB	Basic	\$0.0050	<input checked="" type="checkbox"/>
C7	22uF	C1206	CL31A226KAHNNNE 25V 22uF X5R ±10% 1206 Multil...	C12891		10	JLPCB	Basic	\$0.5310	<input checked="" type="checkbox"/>
C10,C1,C2,...	10uF	C1206	CL31A106KBHNNNE 50V 10uF X5R ±10% 1206 Multil...	C13585		50	JLPCB	Basic	\$1.2600	<input checked="" type="checkbox"/>
U3	HT7533-1_C14289	SOT-89-3_L4.5-W...	HT7533-1 100mA 55mV@(1mA) Fixed 3.3V~3....	C14289		10	JLPCB	Basic	\$1.3460	<input checked="" type="checkbox"/>
R12	10K	R0402	0402WGF1002TCE 62.5mW Thick Film Resistors 50...	C25744		10	JLPCB	Basic	\$0.0060	<input checked="" type="checkbox"/>
R2	8.2kΩ	R0402	0402WGF8201TCE 62.5mW Thick Film Resistors 50...	C25924		10	JLPCB	Basic	\$0.0050	<input checked="" type="checkbox"/>
C11	22uF	C0603	CL10A226MQRNRC 6.3V 22uF X5R ±20% 0603 Multi...	C59461		10	JLPCB	Basic	\$0.0440	<input checked="" type="checkbox"/>
U6	XL1509-ADJE1	SOIC-8_L5.0-W4....	XL1509-ADJE1 Step-down type SOP-8_150mil D...	C74192		10	JLPCB	Basic	\$1.4670	<input checked="" type="checkbox"/>
L2	100uH	IND-SMD_L5.0-W5...	SWPA50405101MT 700mA 100uH ±20% 728mΩ SMD Po...	C88132		11	JLPCB	Extended	\$0.7018	<input checked="" type="checkbox"/>
D4,D6,D7,D...	1N5819WS	SOD-323_L1.8-W1...	1N5819WS 40V 600mV@1A 1A SOD-323 Schot...	C191023		40	JLPCB	Basic	\$0.6000	<input checked="" type="checkbox"/>
Q1,Q2,Q3	SE3082G	DFN-8_L5.5-W5.2...	SE3082G 30V 80A 3.1W 7.5mΩ@10V,25A 3V@...	C238670		30	JLPCB	Extended	\$9.2160	<input checked="" type="checkbox"/>
C6,C12	100nF	C0402	CL05B104KBS4PINC 50V 100nF X7R ±10% 0402 Multi...	C307331		20	JLPCB	Basic	\$0.1320	<input checked="" type="checkbox"/>
SW2	TS-1187A-B-A-B	SW-SMD_4P-L5.1...	TS-1187A-B-A-B No NO 50mA 5.1mm 100mΩ 100000 ...	C318884		10	JLPCB	Basic	\$0.1460	<input checked="" type="checkbox"/>
U1	FD6288Q_C328453	QFN-24_L4.0-W4....	FD6288Q QFN-24 Gate Drive ICs ROHS	C328453		10	JLPCB	Extended	\$6.1350	<input checked="" type="checkbox"/>
CN2	530470610	CONN-TH_6P-P1.2...	530470610 1x6P 1.25mm 6 bronze Straight...	C385109		10	JLPCB	Extended	\$1.5660	<input checked="" type="checkbox"/>
U2	STM32G031G8U6	UFQFPN-28_L4.0...	STM32G031G8U6 ARM® Cortex®-M0+ 64MHz FLASH 1...	C432211		10	JLPCB	Extended	\$11.6850	<input checked="" type="checkbox"/>
CN4,CN1,CN...	530470410	CONN-TH_5304704...	530470410 1x4P 1.25mm Male pin 4 Strai...	C504989		31	JLPCB	Extended	\$2.4428	<input checked="" type="checkbox"/>
M1,M2,M3,M...	M2 PLATED HOLE ...	M2 PLATED HOLE ...	No part selected		Search		Pre-order			

Please carefully check the packages of selected parts before proceeding.

NEXT

Total 20 parts detected 19 Parts confirmed 1 parts not selected

Uploaded BOM Data			Review Matched Parts						
Top Designator	Name	Footprint	Matched Part Detail		Qty	Source	Lib Type	Total Cost	Select <input checked="" type="checkbox"/>
C13	100nF	C0402_NEW	CL05B104K05NNNC 16V 100nF X7R ±10% 0402 Multi...	C1525	<input checked="" type="checkbox"/>	10	JLPCB	\$0.0090 <input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
C5,C8,C9	470nF	C0603	CL10B474KA8NNNC 25V 470nF X7R ±10% 0603 Multi...	C1623	<input checked="" type="checkbox"/>	30	JLPCB	\$0.1800 <input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
R1	1kΩ	R0402	0402WGF1001TCE 62.5mW Thick Film Resistors 50...	C11702	<input checked="" type="checkbox"/>	10	JLPCB	\$0.0050 <input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
C7	22uF	C1206	CL31A226KAHNNNC 25V 22uF X5R ±10% 1206 Multi...	C12891	<input checked="" type="checkbox"/>	10	JLPCB	\$0.5310 <input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
C10,C1,C2...	10uF	C1206	CL31A106KBHNNNC 50V 10uF X5R ±10% 1206 Multi...	C13585	<input checked="" type="checkbox"/>	50	JLPCB	\$1.2600 <input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
U3	HT7533-1_C14289	SOT-89-3_L4.5W...	HT7533-1 100mA 55mV@(1mA) Fixed 3.3V-3...	C14289	<input checked="" type="checkbox"/>	10	JLPCB	\$1.3460 <input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
R12	10k	R0402	0402WGF1002TCE 62.5mW Thick Film Resistors 50...	C25744	<input checked="" type="checkbox"/>	10	JLPCB	\$0.0060 <input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
R2	8.2kΩ	R0402	0402WGF8201TCE 62.5mW Thick Film Resistors 50...	C25924	<input checked="" type="checkbox"/>	10	JLPCB	\$0.0050 <input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
C11	22uF	C0603	CL10A226MB8NRNC 6.3V 22uF X5R ±20% 0603 Multi...	C59461	<input checked="" type="checkbox"/>	10	JLPCB	\$0.0440 <input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
U6	XL1509-ADJE1	SOIC-8_L5.0-W4...	XL1509-ADJE1 Step-down type SOP-8_150mil D...	C74192	<input checked="" type="checkbox"/>	10	JLPCB	\$1.4670 <input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
L2	100uH	IND-SMD_L5.0-W5...	SWPA5040S101MT 700mA 100uH ±20% 728mQ SMD Po...	C88132	<input checked="" type="checkbox"/>	11	JLPCB	\$0.7018 <input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
D4,D6,D7,D...	1N5819WS	SOD-323_L1.8-W1...	1N5819WS 40V 600mA @1A 1A SOD-323 Schot...	C191023	<input checked="" type="checkbox"/>	40	JLPCB	\$0.6000 <input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Q1,Q2,Q3	SE3082G	DFN-8_L5.5-W5.2...	SE3082G 30V 80A 3.1W 7.5mΩ@10V/25A 3V...	C238670	<input checked="" type="checkbox"/>	30	JLPCB	\$9.2160 <input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
C6,C12	100nF	C0402	CL05B104K05NNNC 50V 100nF X7R ±10% 0402 Multi...	C307331	<input checked="" type="checkbox"/>	20	JLPCB	\$0.1320 <input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
SW2	TS-1187A-B-A-B	SW-SMD_4P-L5.1...	TS-1187A-B-A-B No NO 50mA 5.1mm 100mA 10000 ...	C318884	<input checked="" type="checkbox"/>	10	JLPCB	\$0.1460 <input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
U1	FD6288Q_C328453	QFN-24_L4.0-W4...	FD6288Q QFN-24 Gate Drive ICs RC4HS	C328453	<input checked="" type="checkbox"/>	10	JLPCB	\$6.1350 <input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
CN2	530470610	CONN-TH_6P-P1.2...	530470610 1x6P 1.25mm 6 bronze Strai...	C385109	<input checked="" type="checkbox"/>	10	JLPCB	\$1.5660 <input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
U2	STM32G031G8U6	UFOFPN-28_L4.0...	STM32G031G8U6 ARM® Cortex®-M0+ 64MHz FLASH 1...	C432211	<input checked="" type="checkbox"/>	10	JLPCB	\$11.6850 <input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
CN4,CN1,CN...	530470410	CONN-TH_5304704...	530470410 1x4P 1.25mm Male pin 4 Strai...	C504989	<input checked="" type="checkbox"/>	31	JLPCB	\$2.4428 <input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
M1,M2,M3,M...	M2 PLATED HOLE ...	M2 PLATED HOLE ...	No part selected				Search <input type="button" value=""/>	Pre-order	

MANUAL
SOLDER
HEADER
CONNECTORS

DO NOT WORRY ABOUT THIS

Please carefully check the packages of selected parts before proceeding.

NEXT

Next, optional step, we remove from the BOM list all manual soldering parts to make the process and the board a little cheaper. You may skip that part if you don't want to solder, but I like to burn my fingers for a few \$\$ so let's do it. We de-select all pin headers. Choose wisely, as Indiana Jones say.

Click on Next.

At last, we have arrived at the order page. Here you have one last look before you save your order to the shopping cart. Do not worry, you are not paying anything yet, and can cancel the order at any time later and delete it. Review very carefully, once you place into the cart, you need to repeat everything from the very beginning if you need a change. An order in the shopping card cannot be edited.

\$7.46 per 20A Lepton Board, including manual solder, this is awesome!

Price	BOM
Extended components fee	\$12.00
SMT Assembly	\$2.20
Hand-soldering labor fee	\$3.50
Manual Assembly	\$2.89
Build Time	
PCB:	4 days
Assembly:	2-3 days
Total Price	\$74.57
Weight	265.96g

Save To Cart

* The preview for reference only. Check final part placement at DFM Analysis in Order History in 4-6 hours after placing the order.

Finally, we have arrived at the Pièce de Résistance, as French gastronomes say when they see their order of Beef Bourguignon with Truffle mash beings cooked, then stroke their bellies and pull out the Gauloises. Would you like one? No? C'est domage...

SHOPPING CART

Item	Qty	Price
Gerber_PCB_Y194 PCB prototype: Y194-3316671A Green, 1.6 thickness, HASL(with lead) 4 d...	10	\$7.00
Gerber_PCB_Y194 Economic PCBA: SMT02211301044827-3... Assemble top side, 2-3 days	10	\$67.57

SUMMARY (2 items)

Subtotal	\$74.57
Weight	0.22kg

Shipping calculated at checkout

Secure Checkout

+ Add new item

VISA MasterCard American Express PayPal JPBank

SSL ENCRYPTED PAYMENT

From here, the order is in your hands, or as Ostap Bender said, "The task of helping the drowning people is in the hands of the drowning people themselves."

Click on Secure Checkout, and enter your payment information, delivery, etc.

Bon Appetit!

Valentine