

# SMT PCB boards - JLCPCB ordering guide:

Now let's talk about the most important subject! How we are going to get these SMD boards manufactured! Here is a short guide for ordering SMD manufactured boards from JLCPCB!

Surface mount parts might be intimidating for most of us. They need healthy eyes and steady hands to solder. This SMT pcb manufacturing service cures that problem by manufacturing PCBs and installing all smd parts on them in a controlled factory environment! An example of cost for this service: uSDX SOTA Main board will cost you less than 15 US Dollars each for a batch of 10 PCB orders including DHL shipping! This means a PCB with 85% of parts assembled including that SI5351 beast! The trick is the more units of pcb you order the less you pay for one pcb in cost.

The reason for that is there are certain one time fee costs JLCPCB adds to their invoice. Those are SMT setting up fee, extended parts fee etc. These are one time cost charges for each pcb order batch. So if we order 5 pieces of pcb that surcharge cost will be shared by 5 pcbs. If we order 30 pcbs then that surcharge will be divided by 30 and will be less per pcb. That's why it is always order pcbs in larger quantities as a group buy. Ok how we will do this smt ordering business!

I'll explain this as simple as possible in steps:

## **1- We will need Production files:**

In order to place an order a SMT manufactured PCB from JLCPCB we need three files

- GERBER file (contains all the files to manufacture the PCB board itself)
- BOM File (contains all smd parts, their smd footprints and JLCPCB stock numbers for each part)
- Foot print position file (it is also called as centroid file – coordinates of each smd part on the pcb for pick and place robot)

All these files are included in each boards ZIP file under production file directory.

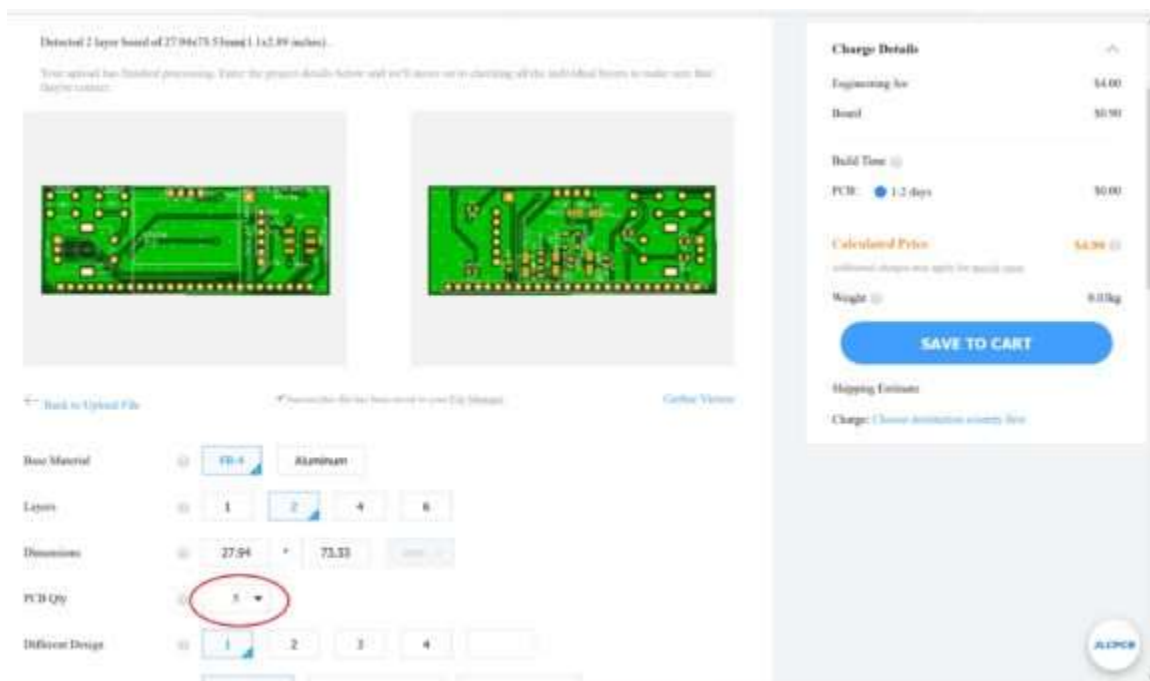
2- Create an account on [www.jlcpcb.com](http://www.jlcpcb.com). Follow instructions on their site.

3- After creating your account with all your credentials click on instant quote button



4- This will bring us to gerber file upload page. Click on add gerber file and upload your uSDX SOTA PCB's gerber file from that pcb's production files folder

5- After uploading your gerber file you will see component and solder side images of your pcb. Now you need to choose how many pcbs you will order in quantity. The minimum is 5 pcbs.



6- Now scroll down the same gerber upload page until you see the Free SMT Assembly for your PCB slide switch which should be light grey inactive position. Now slide it to activate. You should see below screen with top and bottom sides of your PCB. In this case I used uSDX SOTA 128×64 OLED Display as an example. In this display smd populated side is bottom side so I chose assemble bottom side. Now without touching anything else first click on **Confirm** then click on **NEXT**.

**SMT Assembly**

Only accept single sided placement, we recommend you choose the side which has more SMD parts.

\*\*The parts that are not in JLCPCB SMT Parts Library must be placed on one board.

\*\*Please note: If you want not to assemble with SMT assembly, please purchase PCBs with mounting holes.

Assemble top side

Assemble bottom side

SMT QTY: 2

Shipping Status: Added by Customer

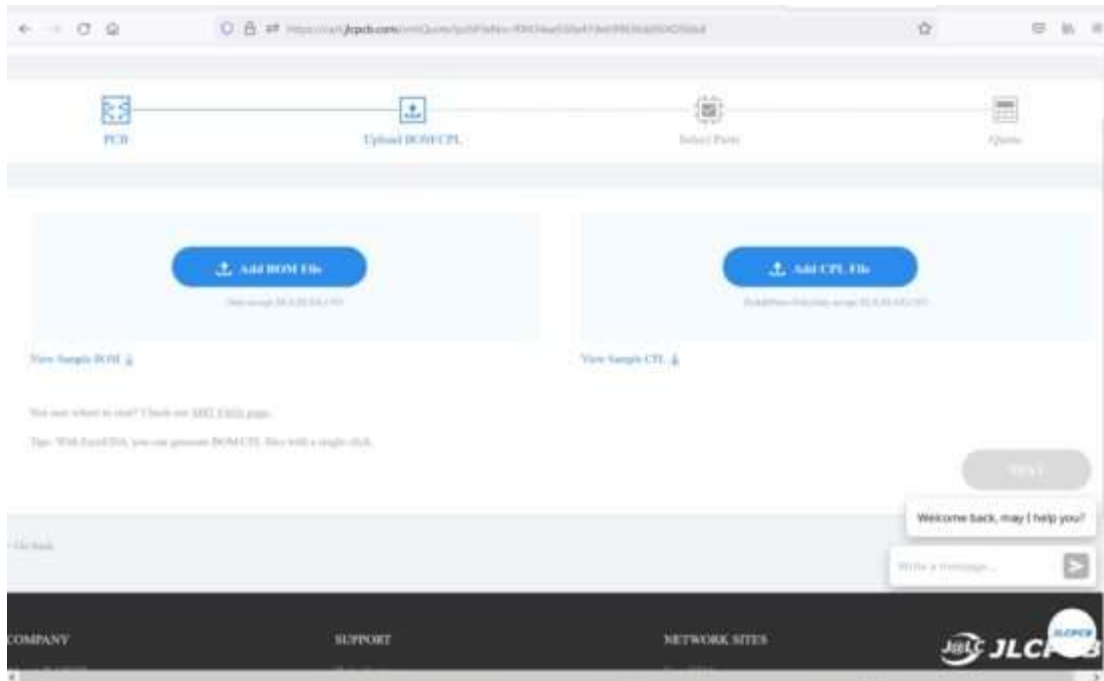
Confirm

**Price List:**

Item	Price
Build	\$0.00
SMT Price	-
Setup Fee	\$7.00
Material	\$1.50
Panel	\$0.00
Large Slot	\$0.00
Components	-
Extended components fee	-
SMT Assembly	-
Build Time	-
PCB	\$0.00
SMT	\$2.00
<b>Calculated Price</b>	<b>\$11.40</b>
Weight	0.00kg
Shipping Estimate	-
Charge	Chinese Addressed Customer

**NEXT**

7- Now we will come to this next screen after clicking on NEXT. This is where we upload our BOM file and footprint position file which is marked as CPL button. These files are in your PCB's production files. First click on **Add BOM File** button and upload BOM file from production files folder. Then click on **Add CPL File** Button and upload your footprint position file from your PCB's production files.



8- After uploading BOM and CPL files this is the screen which shows all the components of our PCB for SMT manufacturing. This table will show all the component part numbers, total number of each component that will be used for the whole batch of PCBs. Also total cost of each part for the whole batch of PCB order.

Uploaded BOM Data			Review Matched Parts				
Designator	Comment	Footprint	Matched Part Detail	Qty	Source	Total Cost	Select
D1,D2	1N4148	Diode_SMD-D_SOD...	1N4148W +150°C (Tj) 170mA -0.1A 75V 1.25...	15	JLCPCB	\$0.2580	<input checked="" type="checkbox"/>
R1	3.3k	Resistor_SMD-R_...	RS-05K332JT ±1% ±100ppm/°C 3.3kΩ 0.125W 0805 Chip...	100	LCSC	\$0.1800	<input checked="" type="checkbox"/>
L1	100uH	Inductor_SMD-L_...	BRL2012T101M 0805 Power Inductors ESR05	20	LCSC	\$2.3420	<input checked="" type="checkbox"/>
R3,R4	10k	Resistor_SMD-R_...	0805WF1001T5E ±1% ±100ppm/°C 10kΩ 0.125W 0805 Chip...	20	JLCPCB	\$0.0900	<input checked="" type="checkbox"/>
C1,C3,C5	10uF 16V	Capacitor_SMD-C_...	VE-100M1ETR-0405 - 5.3mm 4mm - 10uF ±20% -40°C→+85°C 2...	17	JLCPCB	\$0.9163	<input checked="" type="checkbox"/>
C2,C4,C6,C...	100nF	Capacitor_SMD-C_...	CC0805KRX7R9BH104 3.7R 100nF ±10% 50V 0805 Multilayer ...	25	JLCPCB	\$0.2275	<input checked="" type="checkbox"/>
R2,R5	1k	Resistor_SMD-R_...	0805WF1001T5E ±1% ±100ppm/°C 1kΩ 0.125W 0805 Chip...	20	JLCPCB	\$0.0900	<input checked="" type="checkbox"/>

Please carefully check the packages of selected parts before proceeding.

**NEXT**

The most important column in this table is those blue check marks. If you see a blue check mark then it tells you that they have your components and those components have enough stock to manufacture your boards! If one or more parts is not in stock which can happen nowadays as there is chip shortage going on you might get an inventory shortage warning in place of blue

check mark. Now JLCPCB does not have that part in stock and can't pick and place that part and that part will be omitted from pick and place manufacturing. It's not the end of the world! You can still get your pcb manufactured and hand solder those parts when you receive your pcbs.

Here is an example for that:

ID	Value	Package	Part Number	Quantity	Stock Status	Price	Order Status
U1	1203	Package_SOT230G...	SN74ACT125PW	5	LCSC	\$1.9000	<input checked="" type="checkbox"/>
C19,C21,C2...	10nF	Capacitor_SMD C...	CL21B103K80NNC	10	JLCPCB	\$0.8120	<input checked="" type="checkbox"/>
D1,D11	1N4148	Diode_SMD D_SOD...	1N4148W	15	JLCPCB	\$0.2500	<input checked="" type="checkbox"/>
D1	1N5819	Diode_SMD D_SOD...	1N5819W	20	LCSC	\$0.4000	<input checked="" type="checkbox"/>
C13,C18	1uF	Capacitor_SMD C...	CL21B103K80NNC	20	JLCPCB	\$0.2040	<input checked="" type="checkbox"/>
R1,R1,R10...	10k	Resistor_SMD R...	0805WAF1002TSE	51	JLCPCB	\$0.2295	<input checked="" type="checkbox"/>
R2,R10,R10...	1k	Resistor_SMD R...	0805WAF1001ESE	25	JLCPCB	\$0.1110	<input checked="" type="checkbox"/>
R14,R21	47k	Resistor_SMD R...	0805WAF4701SEN	50	LCSC	\$0.2000	<input checked="" type="checkbox"/>
U3	74ACT00	Package_SOT230G...	SN74ACT00DWR	5	LCSC	\$2.0970	Inventory shortage
C4,C5	10nF	Capacitor_SMD C...	VE-0805ETR-0405	12	JLCPCB	\$0.6400	<input checked="" type="checkbox"/>
R6,R7	62k	Resistor_SMD R...	0805WAF6202TSE	20	JLCPCB	\$0.0840	<input checked="" type="checkbox"/>
U4	LM4562	Package_SOT230G...	LM4562MAXNOPB	5	LCSC	\$6.1540	Inventory shortage
C8,C25	10nF 10V	Capacitor_SMD C...	VE-0805ETR-0405	12	JLCPCB	\$0.6400	<input checked="" type="checkbox"/>
C13,C18,C2...	47nF	Capacitor_SMD C...	CL21B473K80NNC	15	JLCPCB	\$0.7525	<input checked="" type="checkbox"/>
C11	100nF	Capacitor_SMD C...	CT0805KX70H0104	20	JLCPCB	\$0.1820	<input checked="" type="checkbox"/>
R4,R23,R2...	10k	Resistor_SMD R...	0805WAF1002TSE	30	LCSC	\$0.3000	<input checked="" type="checkbox"/>
U6	MAX531A	Package_SOT230G...	MAX531AM	15	LCSC	\$10.0545	<input checked="" type="checkbox"/>

This is parts list for uSDX SOTA Main PCB. Two parts, 74ACT00DWR and LM4562 is out of stock. The rest of the parts are in stock so no problem with them. We will just order the PCBS and hand solder those parts afterwards. They are easy to solder smd parts. Now click on NEXT to go to the next ordering screen.

9- This is the next screenshot you will come across which shows your PCB and virtual pick and place finished product layout of your pcb. There might be orientation errors in this PCB virtual parts layout time to time, don't worry about that. JLCPCB will review your pcb layout and pick and place file and then match those positions. After you ordered your PCB for SMT manufacturing they will review it and correct those mismatches. After this review when you access your account you will see a DFM file icon. If you click on that it will show your previous and manufacturing virtual corrected layout.

The parts placement is for reference purposes only. Our engineers will review and fix the components positions in 4-6 hours after you place the order. You can check the result in your order history.

**Selected Parts(7 items)** [Download Selected Parts List](#)

Part Detail	Designator	Qty	Source	Price
0402W0100CTD	R3,R4	20	JLCPCB	\$0.0000
0402W0100CTD	R1	100	JLCPCB	\$0.0000
0402W0100CTD	R1,R2	10	JLCPCB	\$0.0000
0402W0100CTD	R3,R4	20	JLCPCB	\$0.0000
0402W0100CTD	R1,R2	10	JLCPCB	\$0.0000
0402W0100CTD	R3,R4	20	JLCPCB	\$0.0000
0402W0100CTD	R1,R2	10	JLCPCB	\$0.0000

[Show All](#)

**Charge Details**

**PCB Price**

Special Offer: \$2.00

**SMT Price**

Setup Fee: \$7.00  
 Drilled: \$1.20  
 Panel: \$0.00  
 Large Size: \$0.00  
 Components: \$4.11  
 Extended components fee: \$0.00  
 SMT Assembly: \$0.00

**Build Time**

PCB: 2-3 days  
 SMT: 12 hours

**Total Price: \$24.26**

**Weight: 0.04kg**

[JLCPCB](#)

Ok as you will see all is good in this screen. There are 7 parts per pcb and all are selected, none of them left out due to stock shortage issue. Also you can see all those fees and one time charges etc in the right side of this screen. If you are happy with the prices and all then now we can add your pcb order to CART by clicking on save to cart.

**SHOPPING CART**

Item	Qty	Price
<b>GERBER_060X_00TA_OLED_V1_0_Y140</b> PCB (gerber) 060X_00TA_OLED_V1_0_Y140 Items: 1 of 1 (Standard: 060X_00TA_OLED_V1_0_Y140)	1	\$2.00
<b>GERBER_060X_00TA_OLED_V1_0_Y140</b> SMT Assembly: 060X_00TA_OLED_V1_0_Y140 Assembly: 060X_00TA_OLED_V1_0_Y140	5	\$22.26

**SUMMARY (2 items)**

Subtotal: \$24.26  
 Weight: 0.04kg  
 Shipping (estimated at checkout)

[Secure Checkout](#)

[+ Add new item](#)

OR ENCRYPTED PAYMENT

This CART screen will show your total cost for that ordered pcb batch. Now press on secure checkout and follow the procedure by verifying your address then shipment type and then payment etc.

Now let's talk again about our nightmare case where some of the parts were out of stock!

The parts placement is for reference purposes only. Our engineer will secure and fix the components, maximum in 4-6 hours after you place the order. You can check the result in your order history.

**Selected Parts(17 Items)** [Download Selected Parts List](#)

Part Detail	Designator	Qty	Items	Price
15010W	D7.D7	17	JLCPCB	\$0.2480
RCM3001470750	R14.R21	50	JLCPCB	\$0.2400
VS-0881078-0405	C4.C5,C6.C29	22	JLCPCB	\$1.1838
CC-0010KCU700B104	C2.C3,C4.C7,C9...	75	JLCPCB	\$0.0025
AMS-015.3.0	U1	6	JLCPCB	\$0.9570

[Show All](#)

**Unselected Parts(3 Items)** [Download Table](#)

Designator	Comment	Footprint	Qty
U15	74VHC700	PACKAGE: SO-SCHT-14_3.0X5.7 MM_P1.27MM	1
U16	LM5962	PACKAGE: NS-SCHT-8_3.9X4.9MM M_P1.27MM	1
DESIGNATOR	COMMENT	FOOTPRINT	0

**SMT Price**

- Setup fee: \$7.00
- Stencil: \$1.50
- Panel: \$0.00
- Large Size: \$0.00
- Components: \$21.00
- Extended components fee: \$20.00
- SMT Assembly: \$1.70

**Build Time**

- PCB: 2-3 days: \$0.00
- SMT: 72 hours: \$0.00

**Total Price: \$58.28**

**Weight: 144.96g**

**SAVE TO CART**

By placing your order, you agree to Terms and Conditions of JLC Service.

In uSDX SOTA Main board PCB case two parts were out of stock and we still advanced the order and clicked next. Now as outlined in red box those parts are out of production and not listed on main parts list and will not be shown on virtual smt mounted pcb layout. We can still go ahead with the order and save to cart and get main board pcbs manufactured and when we outsource those parts we can hand solder them. It's not the end of the world!

Personally I encourage fellow DIY lover hams to give it a try on ordering uSDX SOTA boards smt manufactured from JLCPCB. You will be surprised how cheap they will be for an order of 10 boards. Even with minimum 5 boards is reasonable price. The biggest benefit is that 85% of the transceiver rig is coming to your door step already soldered in!

Barb WB2CBA

12/05/2021 NY, USA