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How to generate BOM and Pick and Place File in Sprint-Layout 6

In this tutorial, let's see how to generate BOM (Bill of Materials) and CPL (Component Placement List)[Also known as a Centroid file, Pick and Place File, XY File, etc.] for JLCPCB SMT and hand soldering service in Sprint Layout 6.

A very simple PCB that contains only 4 components is used for this tutorial, but the idea is the same for boards have many components.

Set properties for components

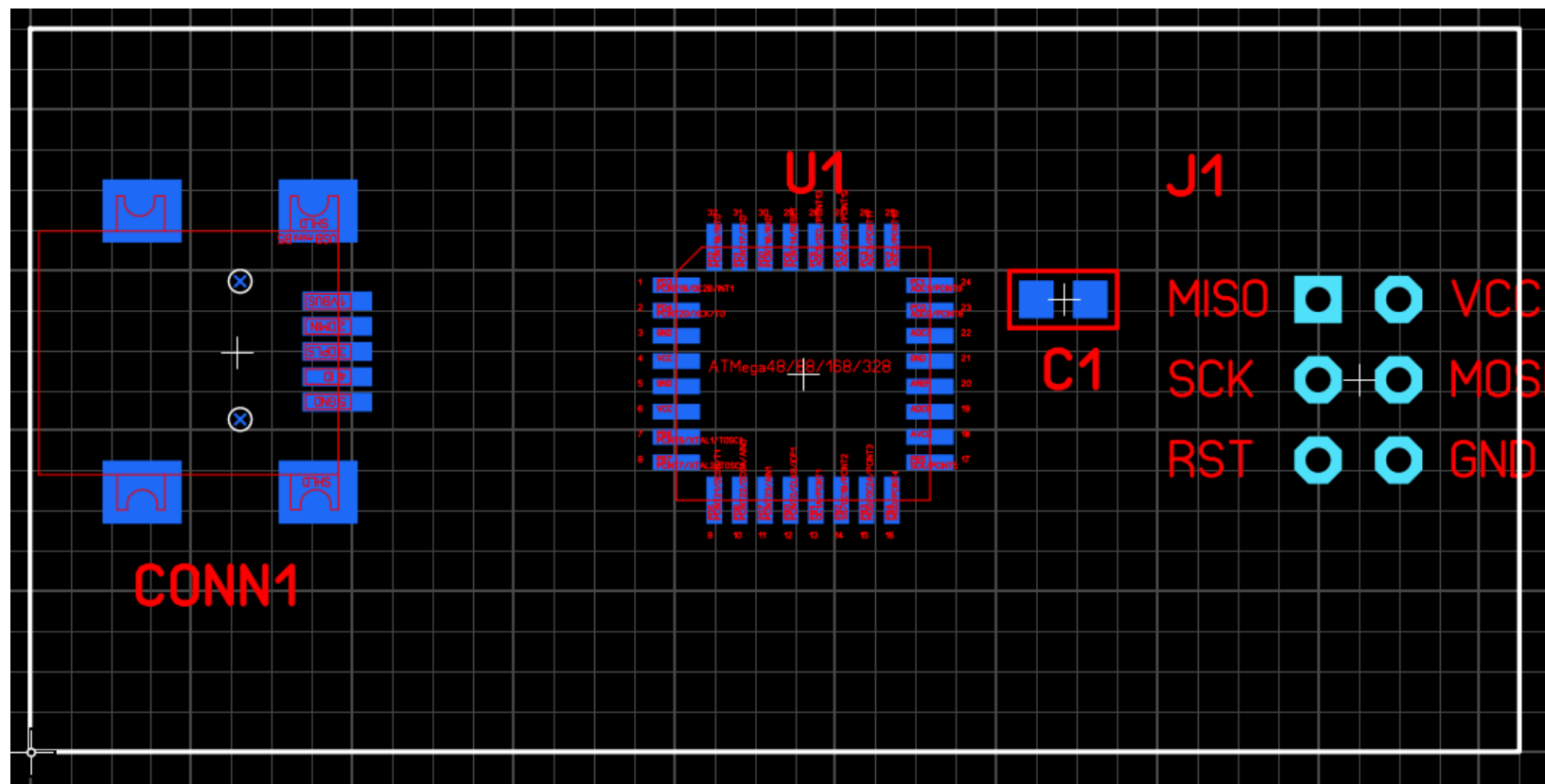


Figure 1. The sample file used for this article

Before generating the BOM and CPL files, we need to add some meta data for components, this information will be used in BOM and CPL files.

For example, in the following screenshot, we set **ID**, **Value**, **Comment** and **Package** for the microcontroller ATmega328P-AU.

Pay attention to the value for Comment, we use this field for a special purpose: Every part available for assembly at JLCPCB has a unique "**LCSC Part #**", its format is Cxxxx, please visit [JLCPCB Part Library](https://www.jlcpcb.com/part-library) to find the parts. If the BOM has this "**LCSC Part #**", this part will be 100% hit when the system executes the BOM matching operation.

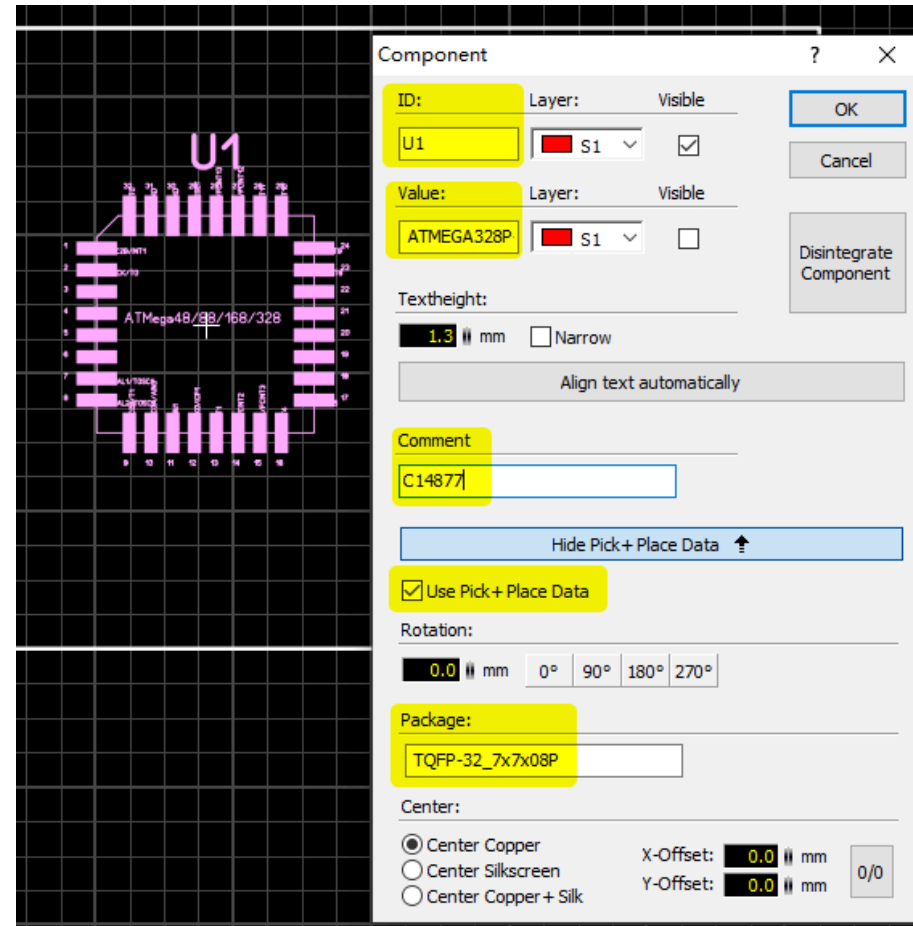


Figure 2. Component's properties

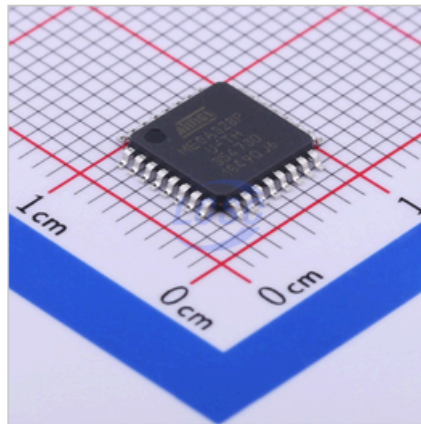
Home / All Categories / Search c14877

EMBEDDED PROCESSORS & CONTROLLERS (1)

ATMEL & AVR (1)

Basic Parts In Stock

Part	Description	Manufacturer
ATMEGA328P-AU	1.8V ~ 5.5V 8-BIT AVR 20MHZ FLAS...	Basic Part MICROCHIP TECH



Part Info	Attributes
Manufacturer	Microchip Tech
MFR.Part #	ATMEGA328P-AU
JLCPCB Part #	C14877
Package	TQFP-32_7.0x7.0x0.8P
Description	1.8V ~ 5.5V 8-Bit AVR 20MHz FLASH TQFP-32_7x7x08P ATMEL & AVR ROHS
Datasheet	Download
Source	JLCPCB
Assembly Type	SMT Assembly
EasyEDA Libraries	PCB Footprint or Symbol

Figure 3. LCSC Part # of the part (also called JLCPCB Part #)

Set meta data for every component.

Export the raw data

To export the data, first we need to make the **Components Panel** visible, just select **Options** → **Components-Panel**.

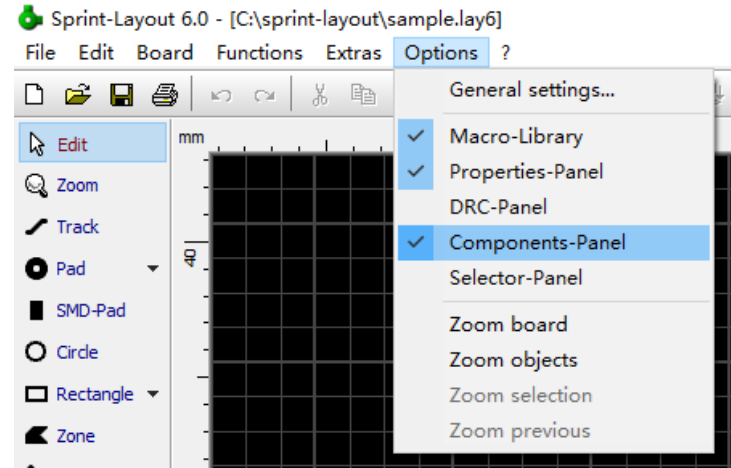


Figure 4. Make Components Panel Visible

Now, click the **Export** button on the **Components Panel**.

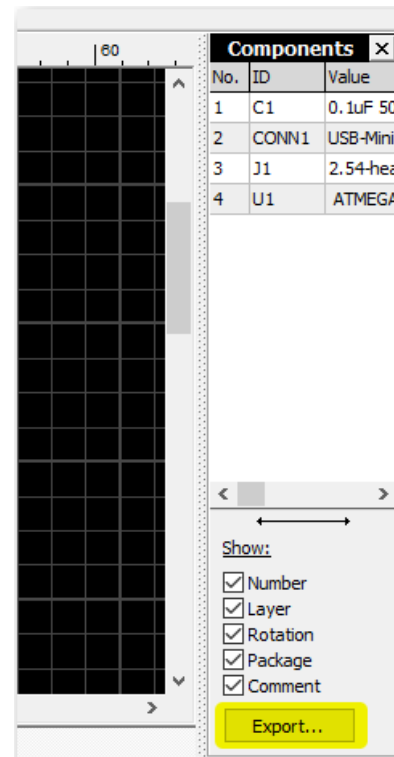


Figure 5. The Export button

The **Component-Data Export** window appears. Check the options as per the screenshot below.

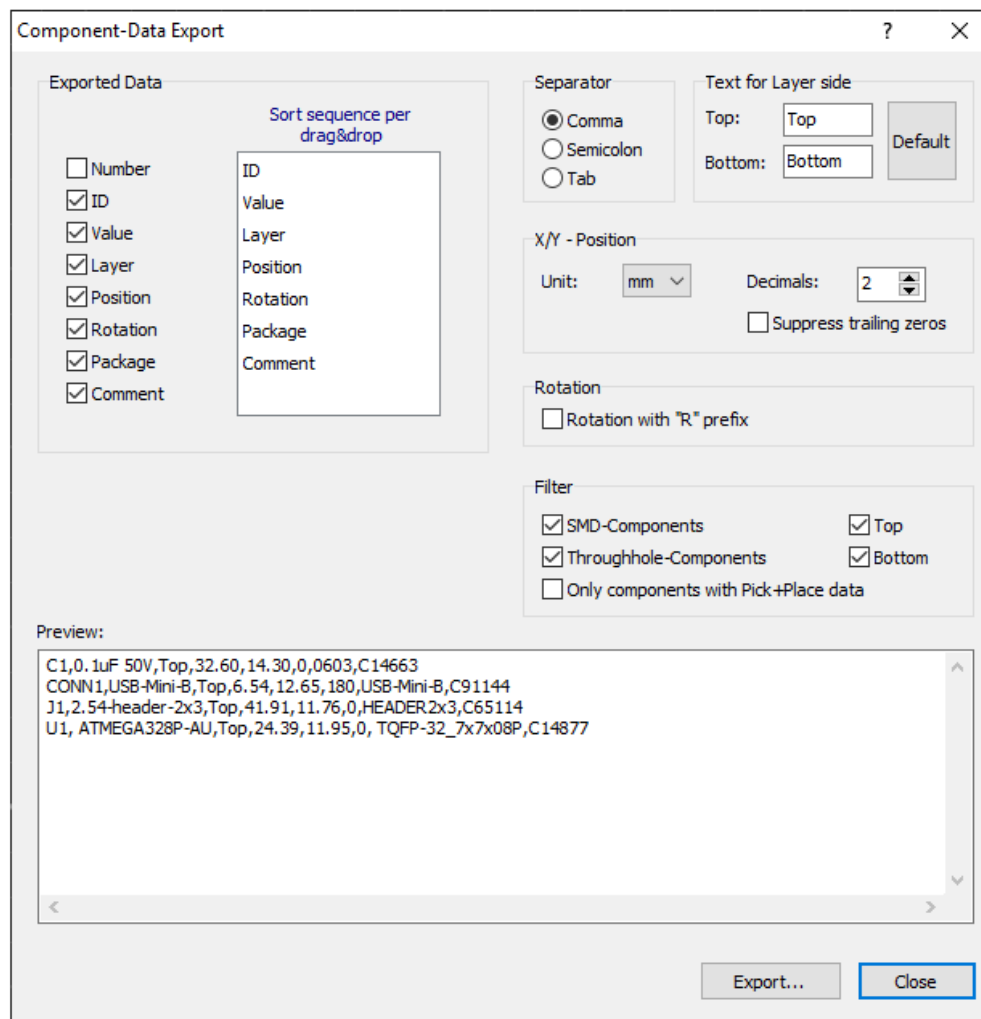


Figure 6. The Component-Data Export window

Click the **Export** button, Sprint-Layout will ask you to specify the filename and file type. Select **All files** for **Save as type**, in this way we can use CSV as the filename extension.

Note	The reason we use CSV as the filename extension is because if a spreadsheet program is installed, the CSV will be opened automatically in some Operating Systems.
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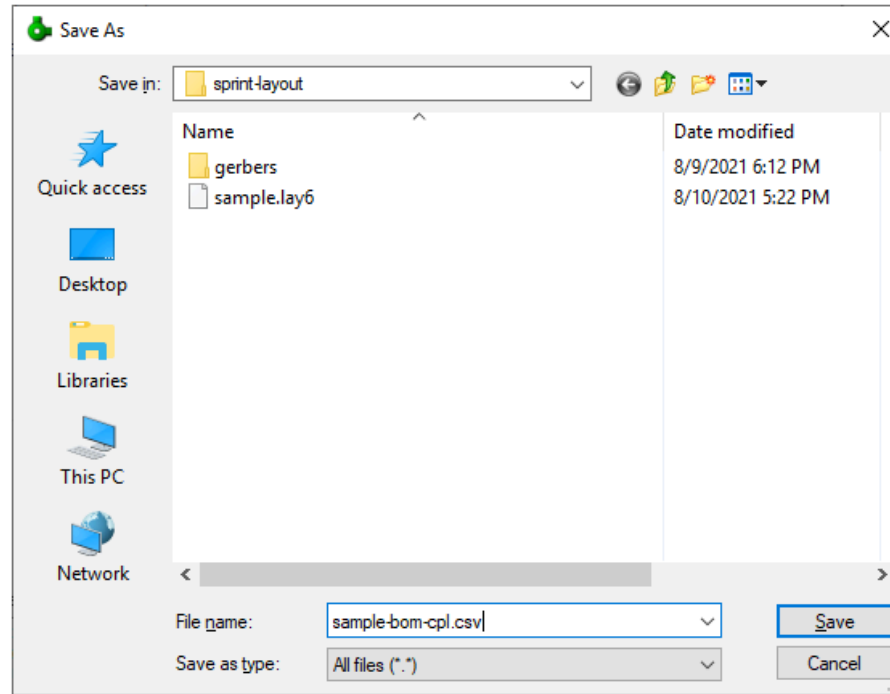


Figure 7. Save the file

Edit the raw data to a CPL file

Make two copies of file sample-bom-cpl.csv and rename them to sample-bom.csv and sample-cpl.csv.

Double click sample-cpl.csv, LibreOffice will bring up the following dialog. Click OK.

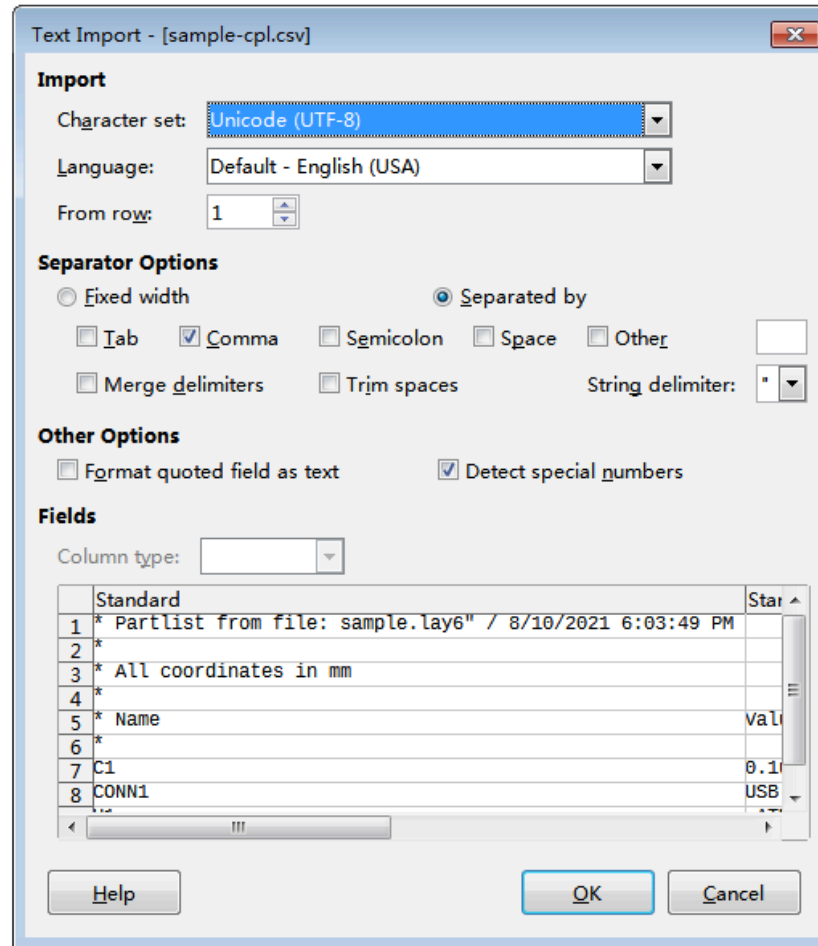


Figure 8. Import CPL

Now, CPL has been imported.

	A	B	C	D	E	F	G	H
1	* Partlist from file: sample.lay6" / 8/10/2021 6:21:31 PM							
2	*							
3	* All coordinates in mm							
4	*							
5	* Name	Value	Layer	Pos-X	Pos-Y	Rot	Package	Comment
6	*							
7	C1	0.1uF 50V	Top	32.6	14.3	0	603	C14663
8	CONN1	USB-Mini-B	Top	6.54	12.65	180	USB-Mini-B	C91144
9	J1	2.54-header-2x3	Top	41.91	11.76	0	HEADER2x3	C65114
10	U1	ATMEGA328P-A	Top	24.39	11.95	0	TQFP-32_7x7x08P	C14877
11								

Figure 9. CPL in LibreOffice Calc

Delete the not needed lines and modify the file according to [JLCPCB's CPL specification](#).

Now we get the clean file.

	A	B	C	D	E	F
1	Designator	Layer	Mid X	Mid Y	Rotation	
2	C1	Top	32.6	14.3	0	
3	CONN1	Top	6.54	12.65	180	
4	J1	Top	41.91	11.76	0	
5	U1	Top	24.39	11.95	0	
6						
7						

Figure 10. CPL file is done

Click **Ctrl+S** to save the file, keep using text CSV format.

	A	B	C	D	E	F	G	H	I
1	Designator	Layer	Mid X	Mid Y	Rotation				
2	C1	Top	32.6	14.3	0				
3	CONN1	Top	6.54	12.65	180				
4	J1	Top	41.91	11.76	0				
5	U1	Top	24.39	11.95	0				
6									
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19									

Confirm File Format

This document may contain formatting or content that cannot be saved in the currently selected file format "Text CSV" .

Use the default ODF file format to be sure that the document is saved correctly.

Ask when not saving in ODF or default format

Figure 11. Save CPL file

Edit the raw data to a BOM file

Double click sample-bom.csv, LibreOffice will bring up the following dialog. Scroll to **Package** column and select **Text** as the **Column type** to keep the leading 0s for 0603, 0402, etc.

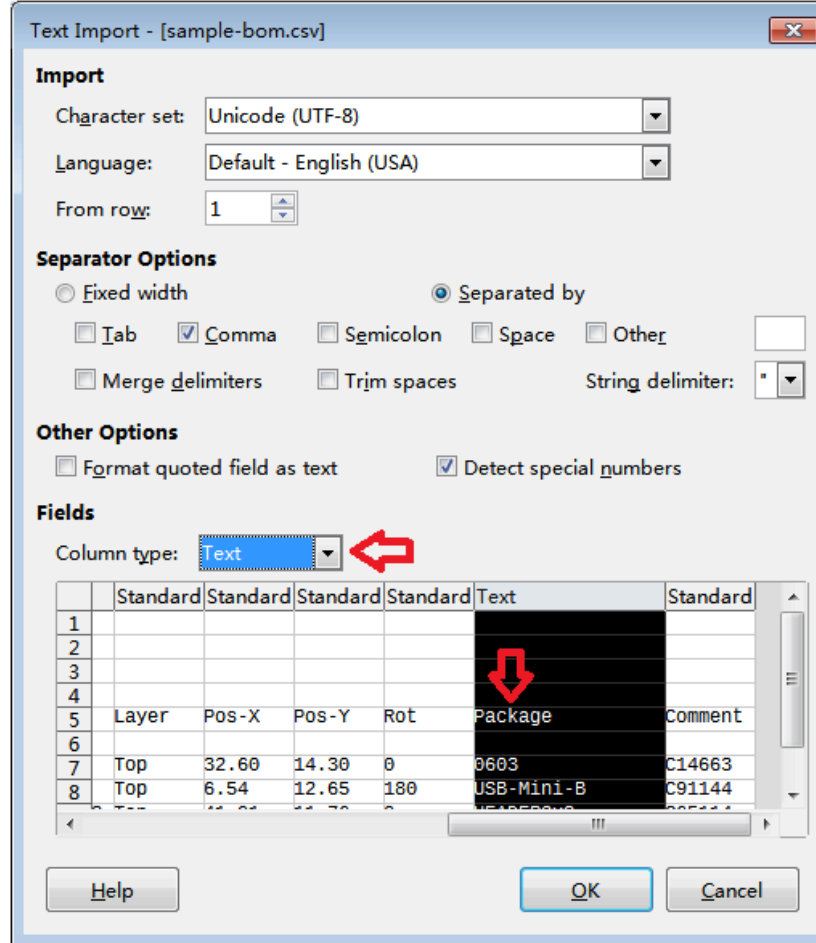


Figure 12. Import BOM

Click **OK**.

Edit the import file to a clean BOM according to [JLCPCB's BOM specification](#). Like this:

	A	B	C	D
1	Designator	Comment	Package	LCSC Part #
2	C1	0.1uF 50V	0603	C14663
3	CONN1	USB-Mini-B	USB-Mini-B	C91144
4	J1	2.54-header-2x3	HEADER2x3	C65114
5	U1	ATMEGA328P-AU	TQFP-32_7x7x08P	C14877
6				
7				

Figure 13. BOM file is done

Click **Ctrl+S** to save the file, keep using text CSV format.

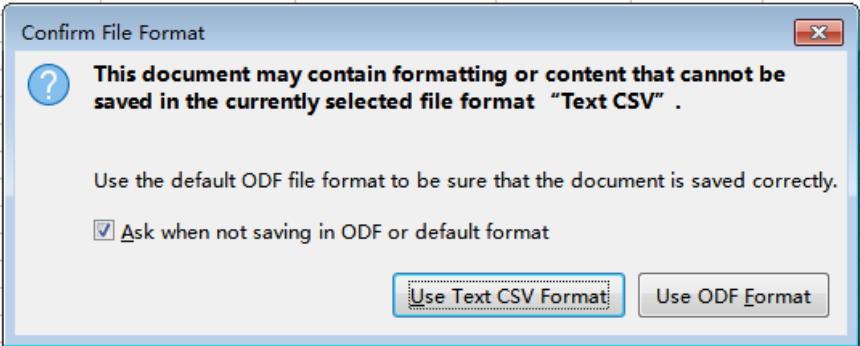
	A	B	C	D	E	F
1	Designator	Comment	Package	LCSC Part #		
2	C1	0.1uF 50V	0603	C14663		
3	CONN1	USB-Mini-B	USB-Mini-B	C91144		
4	J1	2.54-header-2x3	HEADER2x3	C65114		
5	U1	ATMEGA328P-AU	TQFP-32_7x7x08P	C14877		
6						
7	 <p>Confirm File Format</p> <p>This document may contain formatting or content that cannot be saved in the currently selected file format "Text CSV" .</p> <p>Use the default ODF file format to be sure that the document is saved correctly.</p> <p><input checked="" type="checkbox"/> Ask when not saving in ODF or default format</p> <p>Use Text CSV Format Use ODF Format</p>					
8						
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Figure 14. Save BOM

The rotation problem

After uploading Gerbers, BOM and Pick and Place files, if everything goes well, you'll see a preview window which has a rendered PCB with components on it.

Review Parts Placement

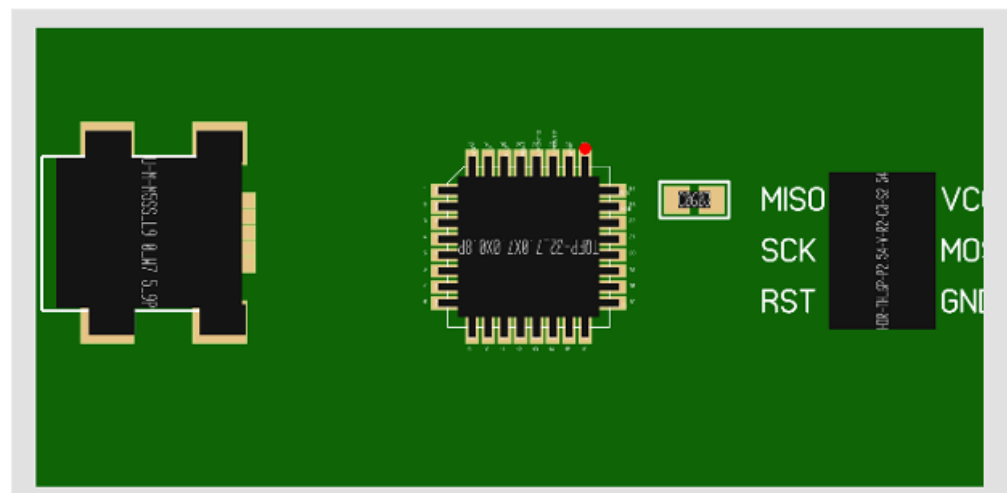


Figure 15. Preview

In the above screenshot you can see the orientation of U1 (ATmega328P) is wrong: The correct pin 1 should be the topmost pin on the left side. We check the **Rotation** value in the CPL file and found the current value is 180 degree, if we rotate it 90 deg more we'll get the right rotation. Now, change the rotation in the CPL to 270 deg and upload it again, the orientation has been fixed in the new image (This is a workaround though, JLCPCB will solve this problem in the near future)

Review Parts Placement

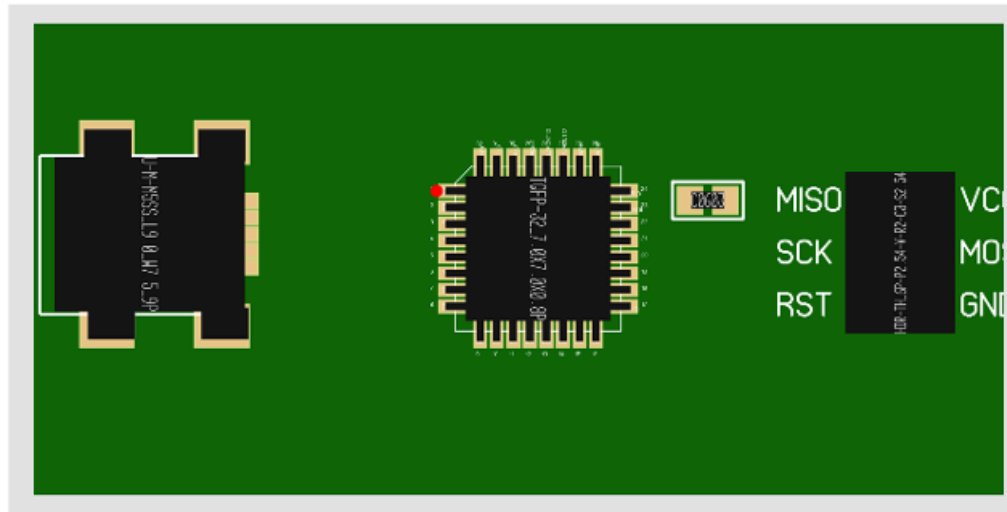


Figure 16. The rotation of U1 has been fixed

Sometimes you may see other issues in this review page: for example, parts are not correctly aligned with the footprint, this is because the preview system is still not good enough. You may ignore this when you place the order, all files will be reviewed by engineers, they'll correct the position and make a high-resolution DFM image for you to confirm.

Last updated on July 25, 2023

Was this article helpful? Yes No

