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Peralta Engineering Studio

Printed Circuit Boards

Mill Specs

PCB Specifications

All PCB layouts submitted for fabrication must meet the following specifications:

- **Maximum PCB size:** 9″ x 12″ (but try to minimize the size of your PCB to save material)
- 2-layer (front and back), FR-4 laminate material, 0.059″ (59 mil) PCB thickness
- 2 oz/ft^2 copper on each side
- For power and ground traces, use a trace width calculator to determine the correct line width and avoid traces popping when you power up the board. Use a minimum 40 mil line width and 6 mil space between traces for all power and ground traces.
- For signal traces, a 15 mil line width and space is recommended. Use a minimum 15 mil line width and space for all signal traces.
- Plated-through holes (PTH) OK
- Solder mask layers OK
- It is recommended to put text in your soldermask or copper layers
- Vias okay, but no blind or buried vias.
- Minimum hole and via size: 0.5mm
- **File format:** Gerber 274X

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We have also listed all of the available bits that we have on hand and some notes on what they are each used for throughout the manufacturing process.

Peralta 109 LPKF S63 Mill Bit Selection Table					
Bit Type	**Size (mm)**	**Size (in)**	**Size (mil)**	**Usage**	**Notes**
Counter Router	1.0	0.0394	39.4	Used for cutting the board outline as well as opening holes	Board outline fileExtension: .art
	2.0	0.0787	78.7		
	3.0	0.1181	118.1		
Drill	0.5	0.0197	19.7	Used to make drill holes for through hole parts as well as mounting holes	Do your best to consolidate your design to the least amount of drill sizes need. The more drill sizes needed in a design will require more tool changes =
	0.6	0.0236	23.6		
	0.7	0.0276	27.6		
	0.8	0.0315	31.5		
	0.9	0.0354	35.4		

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	1.2	0.0472	47.2		sizes outside of the ones available here = more time needed to run you design.
	1.4	0.0551	55.1		
	1.5	0.0591	59.1		
	1.6	0.0630	63.0		
	1.8	0.0709	70.9		
	2.0	0.0787	78.7		
	3.0	0.1181	118.1		Drill File Extension: .drl
Endmill	0.2	0.0079	7.9	Used for removing copper	Only use these in a design if necessary. This process can take a long time depending on the amount of rub out
	0.8	0.0315	31.5		
	1.0	0.0394	39.4		
	2.0	0.0787	78.7		

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Universal Cutter	0.1	0.004	3.9	Used for cutting traces	Top and Bottom files Extension: .art
	0.2	0.008	7.9		

Peralta 109 LPKF S63 Mill's Minimum Requirements		
Item	**Minimums**	**Notes**
Trace widths	Signal Traces = 15 mil, 0.015 in, 0.381 mmPower Traces = 40 mil, 0.04 in, 1.02 mm	The 15 mil trace is the absolute minimum trace width your design should include. The current on those lines should not exceed 500mA for 0.5oz copper. For correct sizing for currents over 500 mA use a trace width calculator.
Vias	19.7 mil, 0.0197 in, 0.5 mmRecommended values31.5 mil, 0.0315 in, 0.8 mm (0-5amp)Or78.7 mil, 0.0787 in, 2 mm (5-10amp)	The default in cadence is too small, please edit it to these sizes or bigger.
Package Sizes	Two Terminal Packages– Resistors and Capacitors = 0805Three Terminal Packages– Small-outline Transistors =	These packages produce good results from the LPKF circuit board mill. While it still can do smaller packages, avoid them as it

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	cannot be smaller than 20 mil, 0.020 in, 0.51 mm– Pitch cannot be smaller than 31.5 mil, 0.0315 in, 0.80 mm– No QFNs or BGAs	Manager.
Insulation Clearances	Thru Pin = 5 milSMD Pin = 5 milVia = 5 milLine/cline = 5 milShape/rect = 5 mil	Set these values to 10 mil to begin with then lower if need.