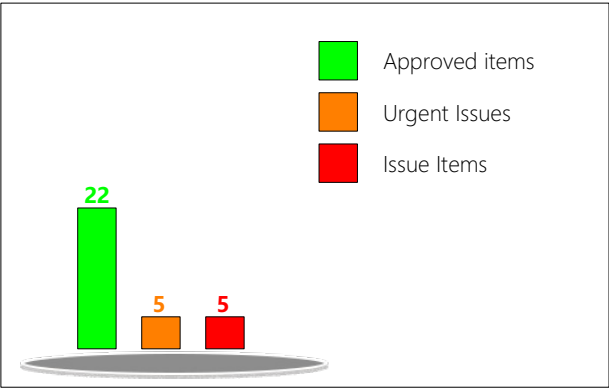


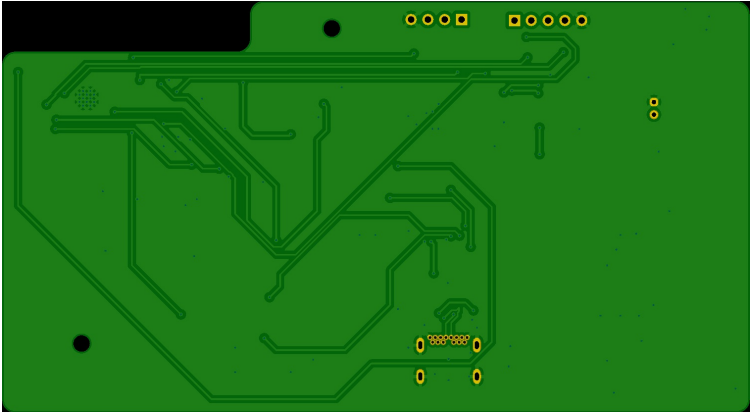
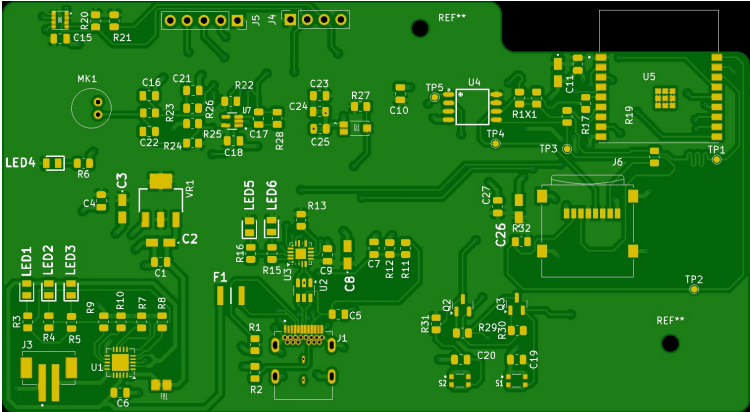
HQDFM Design for Manufacture(DFM) Report

File name: esp32_2L

Time: 2025-07-21 Layer count:2 PCB Thickness: 1.60 Quantity: 5 mm


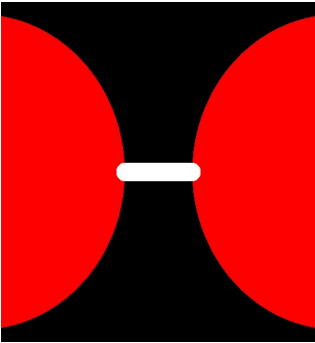


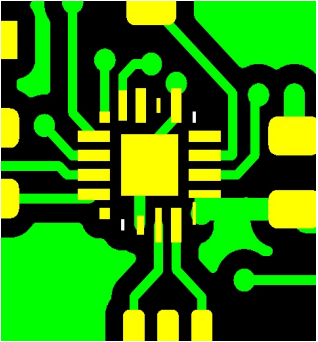
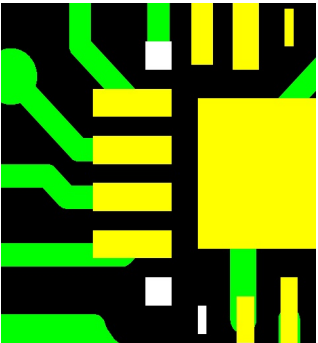
Basic Board Specs	Trace Width/Spacing	10.00/8.00mil
	Milling Density	50.0895m/m²
	Surface Finish Area	7.03%
	Test Point Count	317

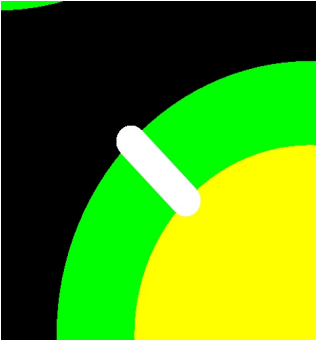
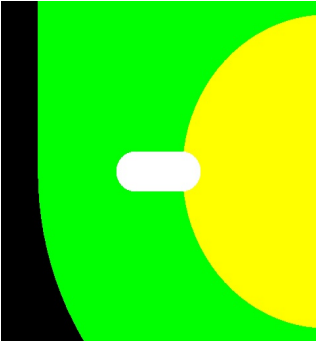


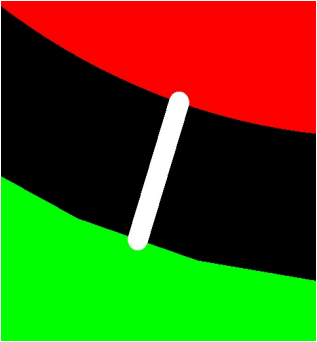
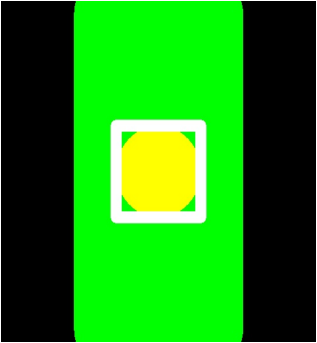
Type	Category	No. of Checks	Result
PCB Trace Analysis	Open/Shorts (IPC)	1	Fail
	Signal Integrity	4	Fail 25
	Smallest Trace Width	1	Pass 2
	Smallest Trace Spacing	3	Pass 327 , Fail 18
	SMD Pad Spacing	1	Pass
	Pad Size	3	Pass 35 , Fail 4
	Hatched Copper Pour	2	Pass
	Annular Ring Size	2	Pass 2 , Fail 2
	Drill to Copper	5	Pass 200 , Fail 4
	Copper-to-Board Edge	2	Pass 33
	Holes on SMD Pads	4	Fail 5
PCB Drilling Analysis	Drill Diameter	8	Pass 15 , Fail 1
	Drill Spacing	4	Pass 16 , Fail 11
	Drill to Board Edge	4	Pass
	Drill Hole Density	1	Pass
	Special Drill Holes	2	Pass
	Drill Hole Errors	3	Pass
PCB Solder Mask Analysis	Solder Mask Dam	3	Pass 14 , Fail 2
	Missing SMask Opening	1	Pass
	Solder Paste Area	1	Pass
PCB Silk Analysis	Silkscreen Spacing	1	Pass 5

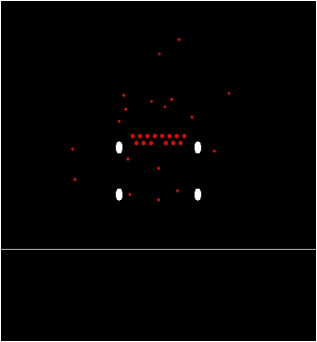
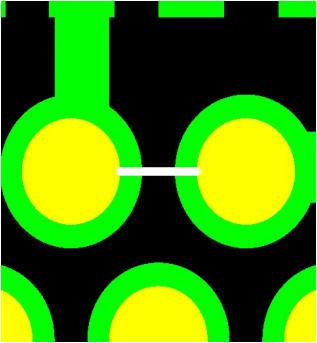
PCBA Component Analysis	Component Spacing	2	Fail
	Comp Height Analysis	3	Pass
	Comp.-to-Board-Edge	3	Fail
	Component Silkscreen Spacing	0	Fail
	Pad Count Mismatch	4	Fail
	Designator Length	0	Fail
	Double-sided Components	1	Pass
	Mid Mount Comp	1	Pass
PCBA Pin Analysis	SMT Pad Analysis	8	Fail
	Through-hole Pins	10	Fail
PCBA Pad Analysis	Chip Pads	60	Fail
PCBA Fiducial Analysis	Fiducial Count	1	Fail
	Fiducial Analysis	4	Pass

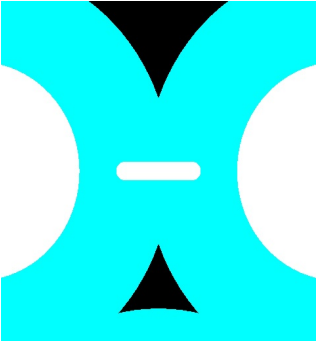
ID	Check	Limits	Value	Issue	Image	Position	Qty	Level
1	Signal Integrity_Acute Angle Traces	-,,-	Error(s) detected	There is an acute angle connection mode in your design,which will affect the signal integrity of the product.it is recommended to adjust the acute angle position to arc or obtuse angle connection mode		98.79,-94.88	2	Warning
2	Smallest Trace Spacing_SMD Pad Spacing	4,6,10	0.15 mm	Pad-to-pad spacing of 5.91mil were detected in your design. This could result in incomplete solder mask dams between the pads, thereby increasing the risk of incomplete etching of the pads, which decrease manufacturing efficiency and yield, and affect the reliability of the boards. It is recommended to increase the spacing to at least 6 mil. For solder mask covered pads, 4 mil spacing is sufficient.		101.76,-99.09	21	Warning

3	Pad Size_Long Pads	6,7,10	0.10 mm	<p>For most factories, the minimum pad width requirement for rectangular pads is 0.2 mm. Failure to meet the factory's requirement could result in overetching, detached pads and increased testing costs, which decrease manufacturing efficiency and yield, and affect the reliability of the boards. Rectangular/Oblong pads with width 0.10mm were detected in your design. The width should be enlarged to at least 0.2 mm.</p>		100.00,-86.57	24	Risk
4	Pad Size_Short Pads	8,12,20	0.10 mm	<p>Regular pads of size 0.30mm were detected in your design. This could result in overetching, detached pads and increased testing costs, which decrease manufacturing efficiency and yield, and affect the reliability of the boards. The pads should be enlarged to at least 0.3 mm if possible.</p>		98.50,-86.42	14	Risk

5	Annular Ring Size_PTH Annular Ring	6,7,8	0.05 mm	<p>PTH Pad Rings3.91 mil in size were detected in your design. This could increase the risk of tangency or breakouts, which decrease electrical reliability and yield, and affect the reliability of the boards. It is recommended that PTH Pad Rings have a width of at least 6 mil.</p>		97.56,-99.61	2	Risk
6	Annular Ring Size_Via Annular Ring	4,5,6	0.05 mm	<p>Min via annular rings1.95mil in size were detected in your design.It will affect production efficiency and electrical reliability. It is recommended that the minimum ring size for "via annular rings" be ≥ 5 mils.</p>		153.55,-62.41	2	Risk

7	Drill to Copper_NPTH-to-Copper	8,10,12	0.25 mm	<p>NPTH to copper spacing of 9.86mil was detected in your design. This could increase the risk of defects such as short circuits, which decrease manufacturing efficiency and yield, and affect the reliability of the boards. It is recommended to increase the spacing to at least 12 mil.</p>		117.38,-53.71	4	Warning
8	Holes on SMD Pads_Via on SMD Pad	0.15,0.05,0	100.00 %	<p>Holes on surface mount pads were detected in your design. During SMT assembly, solder could leak into the hole and pull solder away from the SMD contact, which could decrease manufacturing efficiency and yield, and affects the reliability of the boards. Please check and separate the holes from the pads if possible.</p>		100.26,-90.83	5	Risk

9	Drill Diameter_Slot Aspect Ratio	1.5,2,2	0.30 mm	<p>Slots with aspect ratio of 1.92 were detected in your design. This could increase the risk of incomplete drilling of the slot, which decrease manufacturing efficiency and yield, and affect the reliability of the boards. The ratio should be increased to at least 2:1</p>		100.16,-102.61	1	Warning
10	Drill Spacing_Different Net PTH Spacing	0.4,0.45,0.5	0.35 mm	<p>For most factories, the different net PTH spacing requirement is 16-18 mil. Failure to meet the factory's requirements could increase the risk of solder bridges during soldering, which decrease manufacturing efficiency and yield, and affect the reliability of the boards. Different net PTH spacing of 13.74mil were detected in your design. It is recommended to increase the spacing to at least 17 mil.</p>		101.76,-99.09	11	Risk

11	Solder Mask Dam_Solder Mask Dam	5,6,10	5.91 mil	<p>Solder mask dam of width less than 5.91mil were detected in your design.</p> <p>This could result in incomplete solder mask dams between the pads, thereby increasing the risk of solder bridges during assembly, which decrease manufacturing efficiency and yield, and affect the reliability of the boards.</p> <p>The width should be at least 6 mil where possible.</p>		102.56,-99.09	2	Warning
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