Synthlife Stress Monitoring Device

31/08/2024

Identified Errors in PCB

1. Via and Trace Length Issues

(a) **Issue:** Two vias used to connect EN and R6 introduce high impedance. Therefore, less current is drawn. Due to that, the chip is not properly getting booted.

(b) **Issue:** The distance between R6 and EN pins are long, causing timing errors.

- **Solution:** Directly connect EN and R6 without vias.

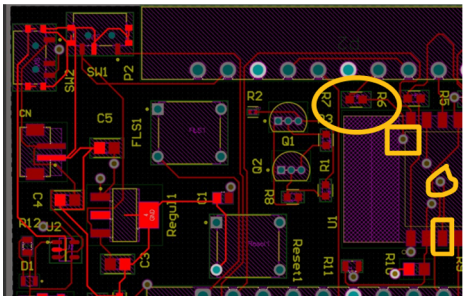

Figure 1: EN and R6 connection issue.

2. Closely Placed Vias

Issue: Closely placed vias introduce high impedance, restricting the current.

- **Solution:** Use a minimum number of vias for routing and keep them further away from each other.

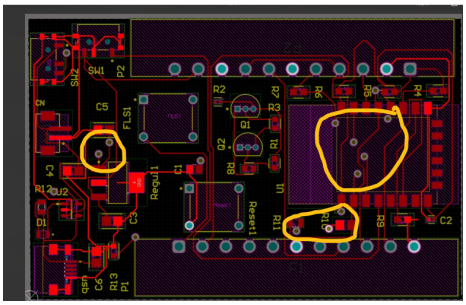

Figure 2: Closely placed vias causing high impedance.

3. Trace and Regulator Issues

Issue: The distance between the Regulator output pin and VCC of the chip is high, causing an increase in resistance due to the length of the traces. This results in insufficient current supply.

- **Solution:** Make the traces wider. Replace the regulator with a higher current output (e.g., avoid using AMS1117 due to heat dissipation issues).

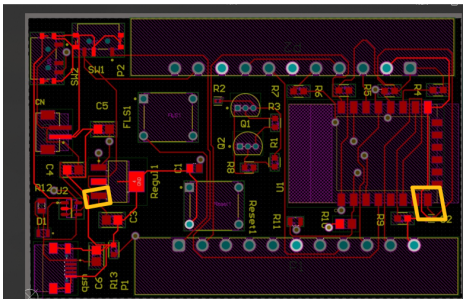

Figure 3: Trace length and regulator issues.

4. GPIO2 is not correctly pulled up

Issue: When booting GPIO2 should be 1. Since we have used 12k resistor as the pull up resistor funcionality of GPIO2 is corrupted.

- **Solution:** Using a 2.2k resistor to pull-up GPIO2 or else leave it as a floating pin and control GPIO0 during reboot to switch between automatic flash downloading and normal boot up.

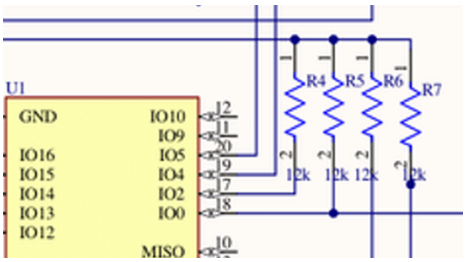

Figure 4: GPIO2 pulled-up wrongly