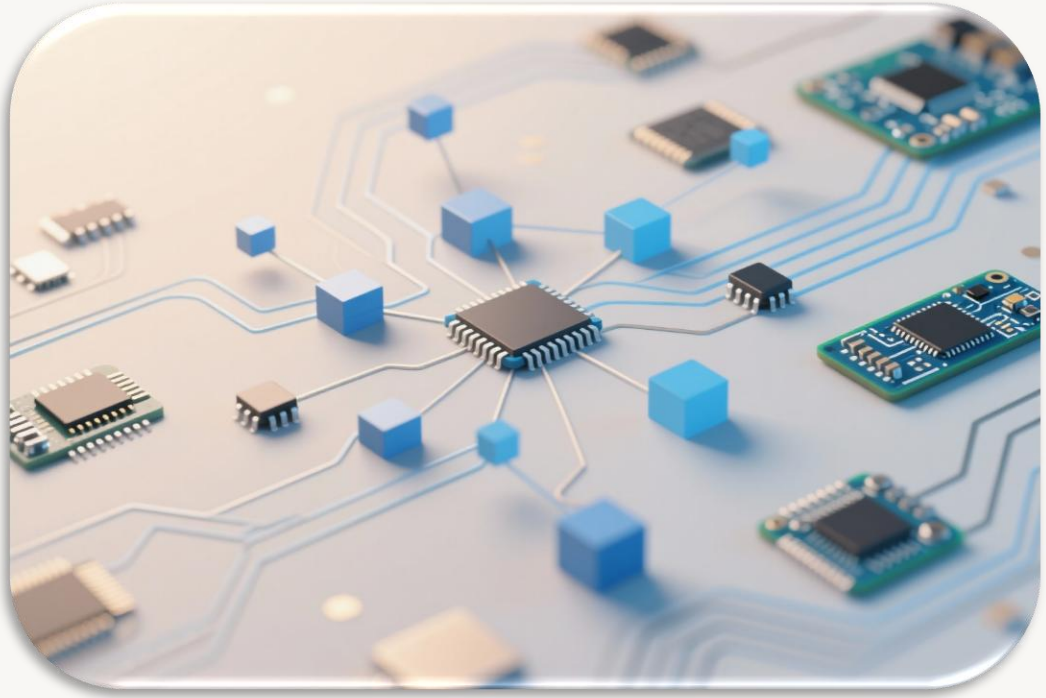
KiCon Asia 开发者大会|2025年11月

从开源出发

KiCad转换立创工程的喵伴复刻故事

From Open Source: KiCad Conversion of Lichuang Engineering - Miaoban Replication Story

演讲者：王志强|华秋硬件工程师
Speaker: Wang Zhiqiang|Huaqiu Hardware Engineer



PROJECT ORIGIN

邂逅开源的魅力 为什么选择喵伴

2025年7月9日，一个普通的工作日，我遇到了乐鑫与火山引擎扣子大模型团队联合打造的喵伴项目。

On July 9, 2025, I discovered the Miaoban project jointly developed by Espressif and Volcano Engine.

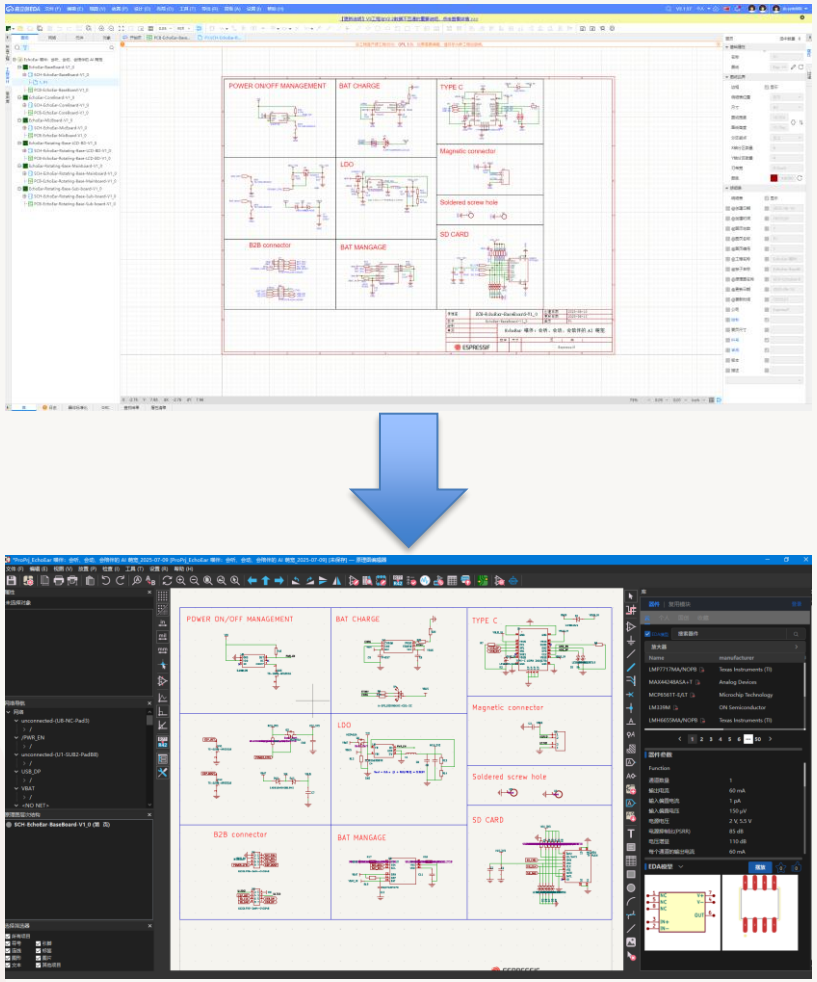
开源的价值

在硬件开发领域，开源项目扮演着越来越重要的角色。它们不仅降低了技术门槛，更重要的是建立了一个知识共享、经验传承的生态系统。

Open source projects play an increasingly important role in hardware development, lowering technical barriers and establishing a knowledge-sharing ecosystem.

技术选型：从立创EDA到KiCad的转换之路

Technology Selection: The Transition Path from Lichuang EDA to KiCad



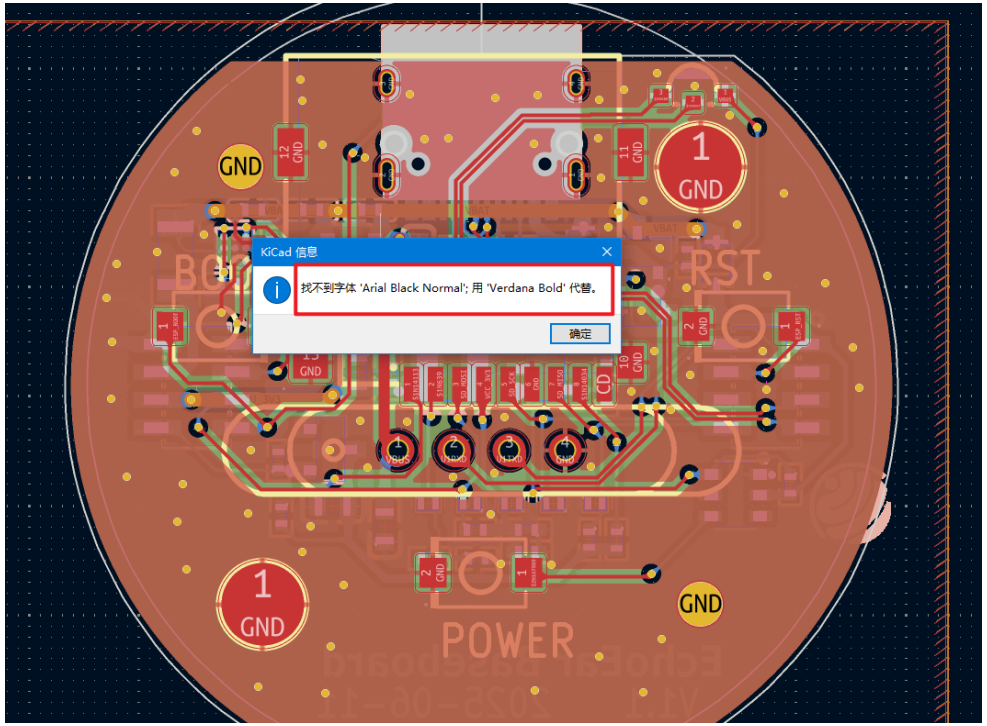
1. **文件格式挑战**
   立创EDA的.epro文件格式与KiCad的兼容性

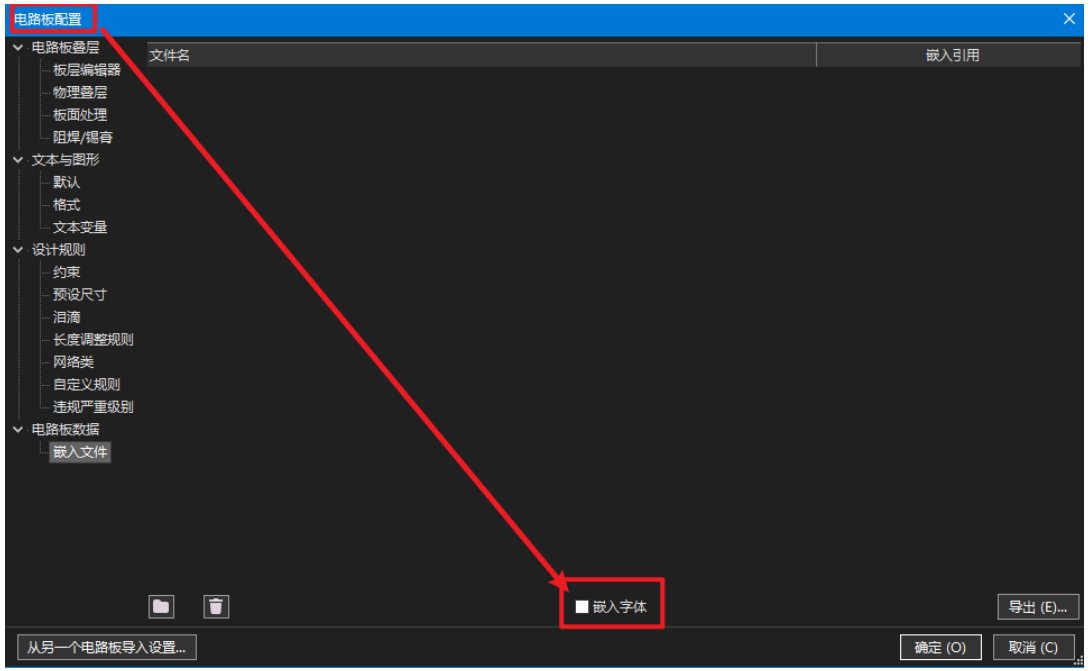
2. **多次导入过程**
   6块板子需要分别导入，每次都需要精确操作

3. **精确映射关系**
   确保元件、网络、封装的一一对应

核心挑战：在KiCad中选择"导入非KiCad工程下的嘉立创专业版工程"，确保每个元件、每个网络、每个封装都能正确映射。

Core Challenge: Selecting "Import JLCPCB Professional Edition Project from Non-KiCad Projects" in KiCad to Ensure Accurate Mapping of Every Component, Every Net, and Every Footprint

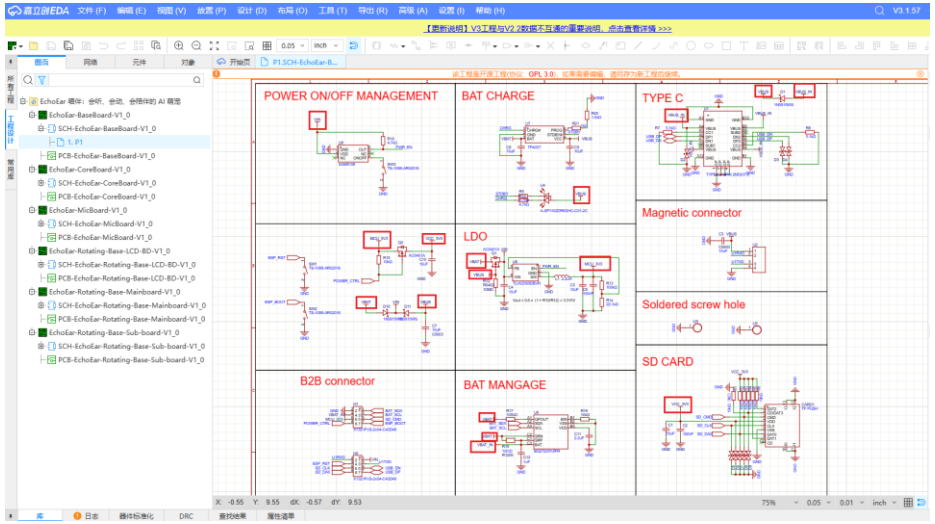


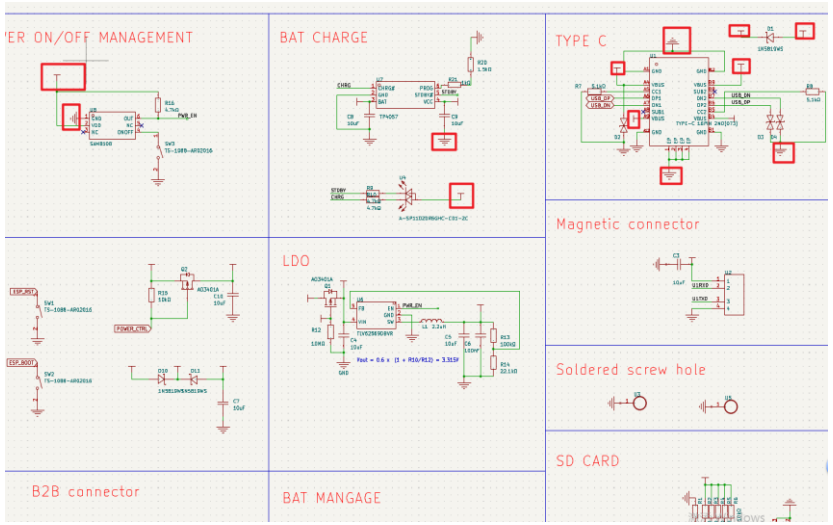


技术挑战与解决方案—主板

Technical Challenges and Solutions — BaseBoard

- **字体与符号的适配 | Font & Symbol Adaptation**
- 问题：KiCad缺少立创字体，电源符号无法识别
- Problem: KiCad lacks LCSC fonts, resulting in unrecognizable power symbols.
- 解决：嵌入字体设置，手动修改电源符号
- Solution: Set up font embedding and manually modify the power symbols.

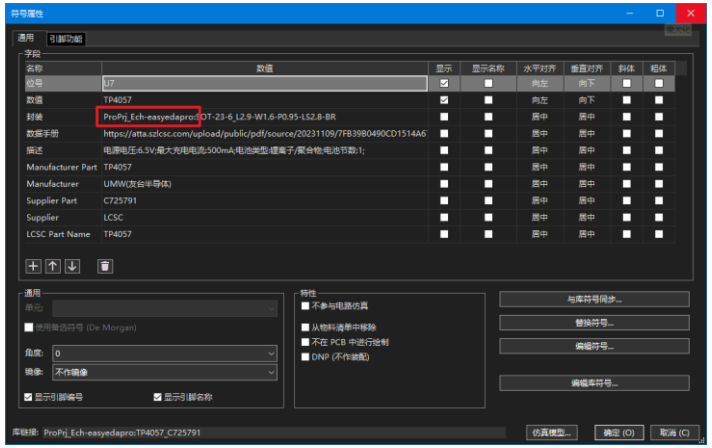


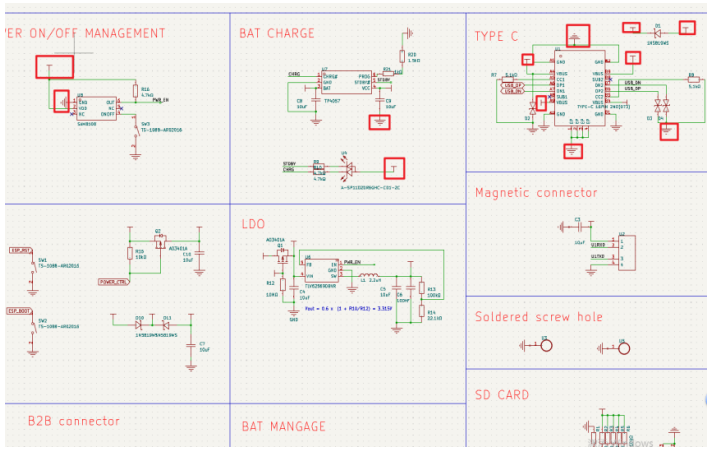


技术挑战与解决方案—主板

Technical Challenges and Solutions — BaseBoard

- 电源符号不匹配 | Power - supply symbols are not matched
- 问题：无法识别立创的电源标签
- Problem: Unable to recognize LCSC power labels.
- 解决：仔细对比所有电源标签并修改
- Solution: Carefully compare all power labels and modify them.

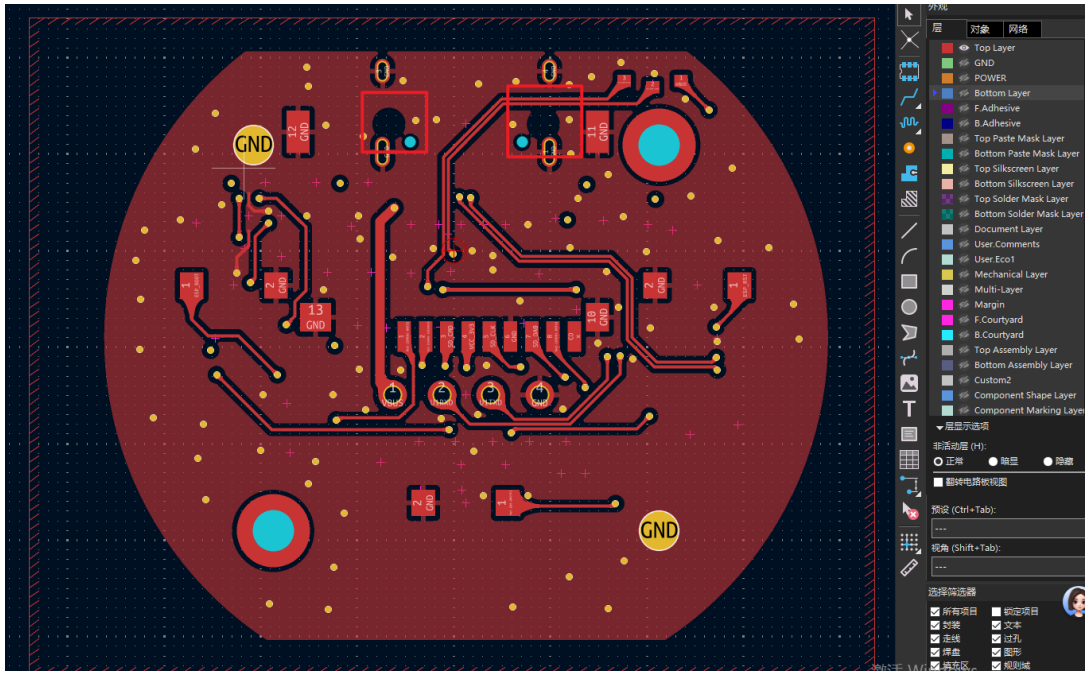


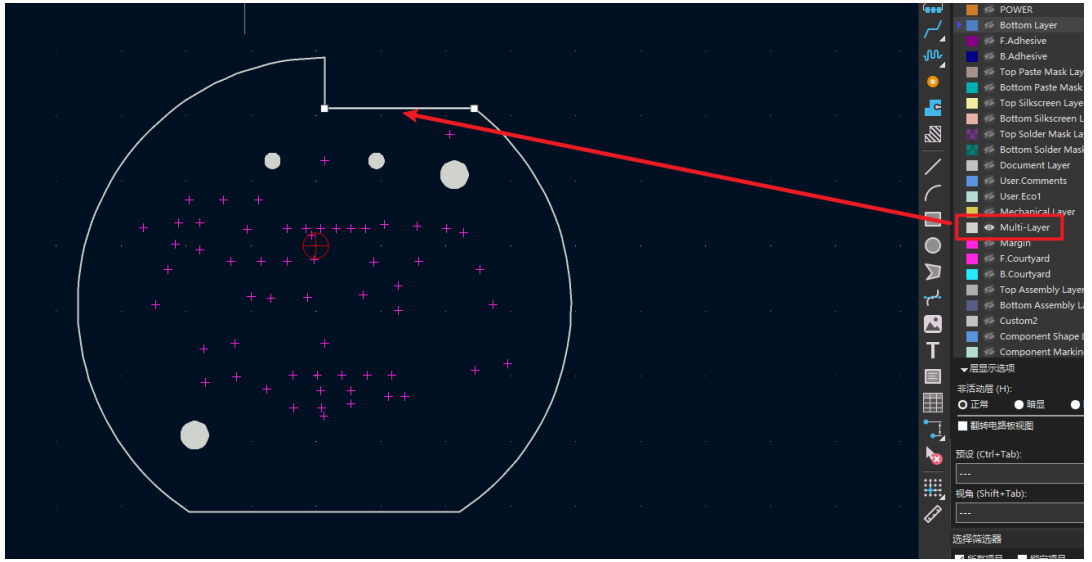


技术挑战与解决方案—主板

Technical Challenges and Solutions — BaseBoard

- **封装库的匹配挑战 | Footprint Library Matching**
- 问题：封装库名称不匹配，ERC检查失败
- Problem: The footprint library name does not match, and the ERC check fails.
- 解决：手动修改所有器件封装，添加pwr_flag标签
- Solution: Manually modify the footprints of all components and add the pwr_flag label.





技术挑战与解决方案—主板

Technical Challenges and Solutions — BaseBoard

- **PCB层面的技术细节 | PCB Level Technical Details**
- 问题："孔"变"洞"，板层命名差异
- Question: "Kong" (Chinese term for "hole") changed to "Dong" (another Chinese term for "hole"), differences in layer naming
- 解决：手动调整板框层，设置锡膏间距为0
- Solution: Manually adjust the board outline layer and set the solder paste spacing to 0

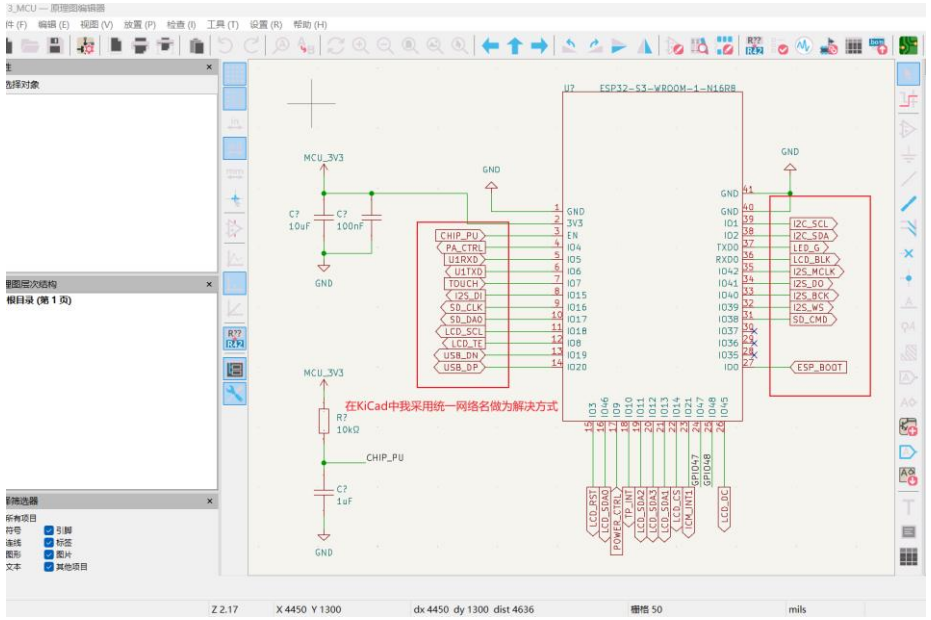
技术挑战与解决方案—核心板
Technical Challenges and Solutions — CoreBoard

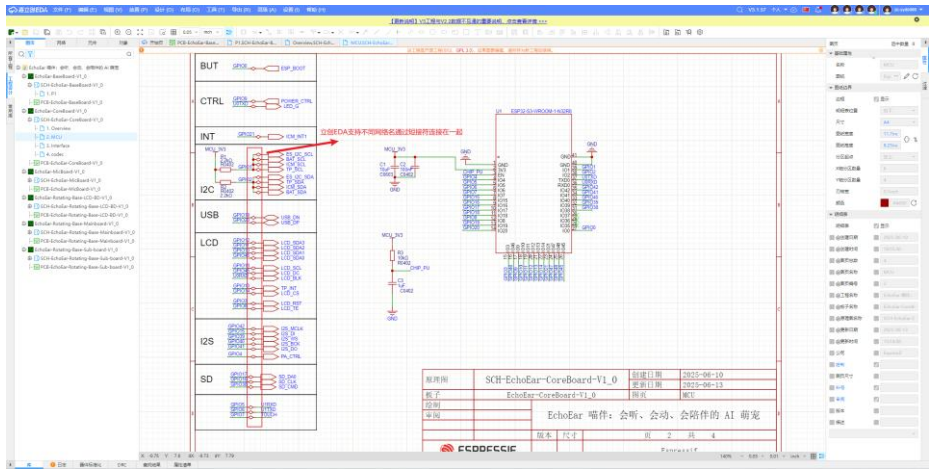
网络连接创新

立创EDA：支持不同网络名连接

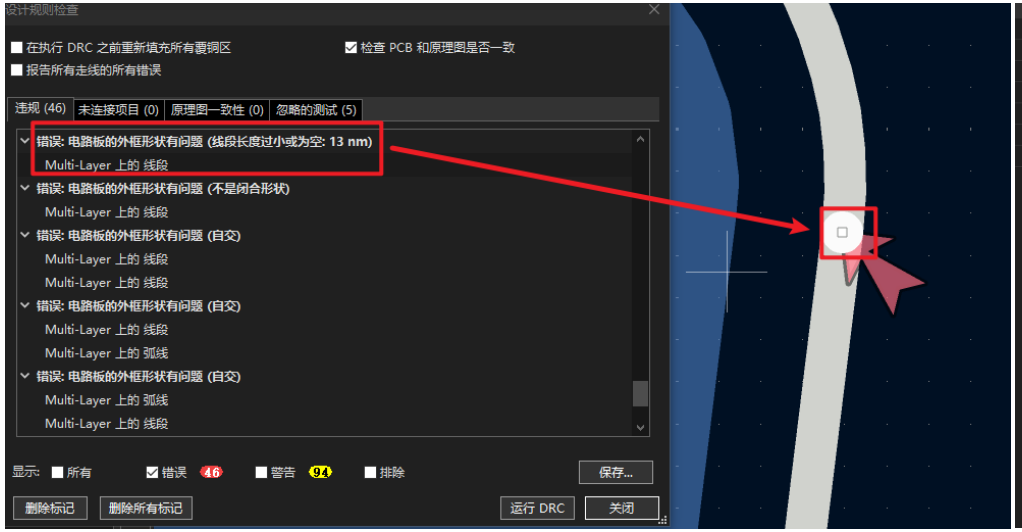
KiCad限制：NetTie需要匹配封装

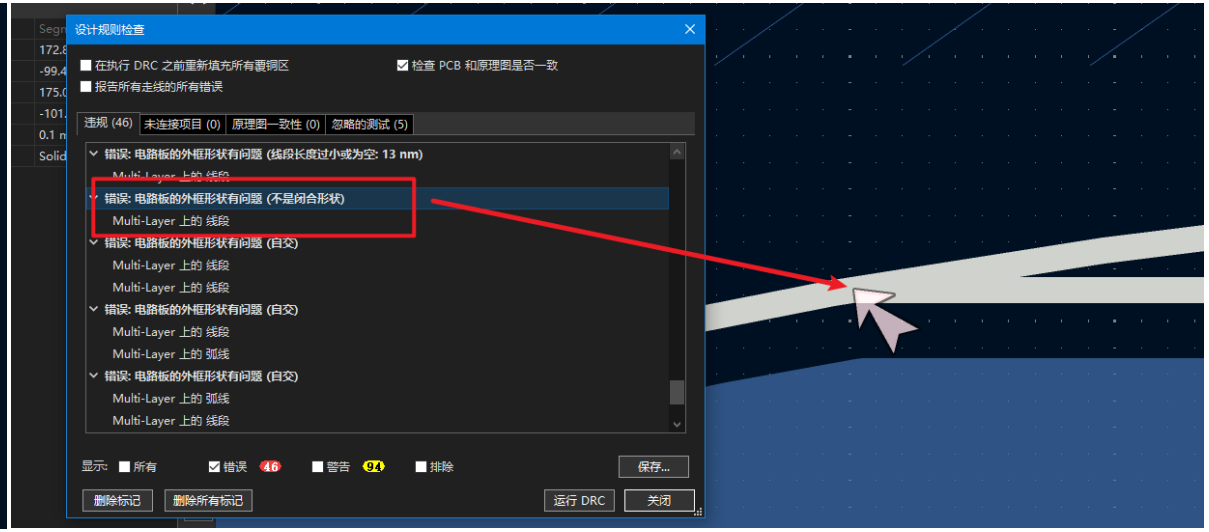
解决方案：统一网络名，修改原理图端口





技术挑战与解决方案—麦克风板
Technical Challenges and Solutions — MicBoard





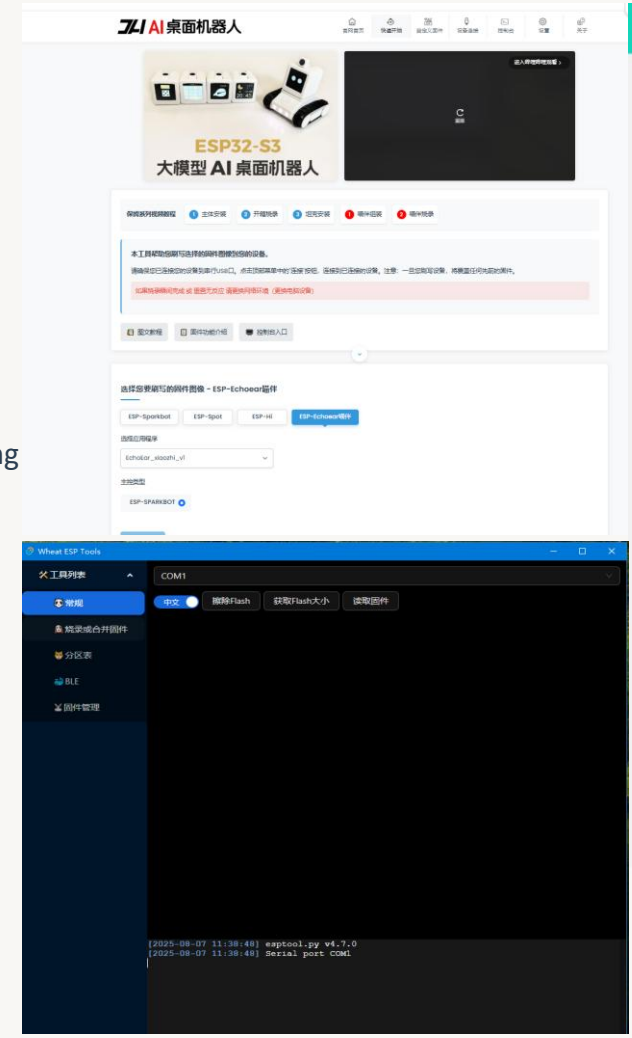
立创EDA导入KICAD中时会将板框层重新命名为Multi-Layer，且板框层存在细小冗余线段且板框连接处会报错，根据DRC提示手动删除即可。

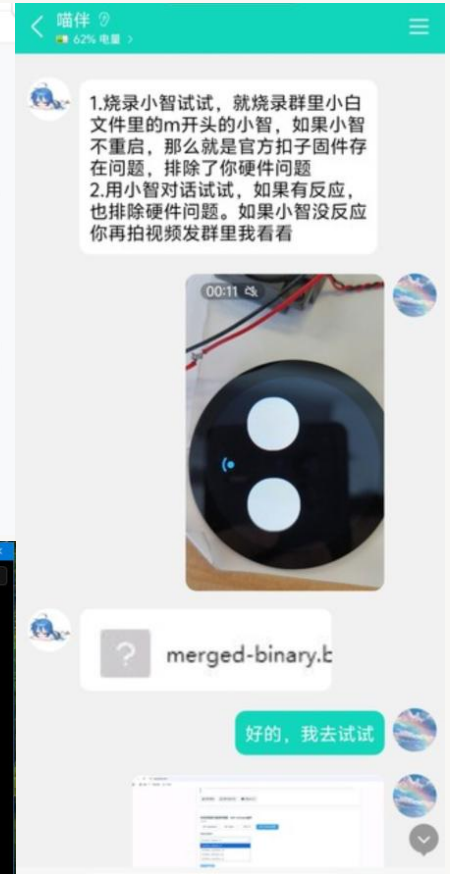
调试与问题解决的艺术

The Art of Debugging and Problem - Solving

调试过程回顾

1. 初次组装：电池接口不匹配|Initial Assembly: Battery interface mismatch
2. 固件烧录：端口闪烁问题|Firmware Burning: Port flashing problem
3. 交互调试：无法交互|Interactive Debugging: Unable to interact
4. 社区求助：复刻群提供建议|Community Help: Replication group provides suggestions
5. 官方支持：乐鑫工程师线下调试|Official Support: Espressif engineers conduct on - site debugging
6. 问题解决：ES7210芯片虚焊|Problem - solving: ES7210 chip cold - soldering





最终解决方案

根本原因：

ES7210芯片I2C信号引脚因插拔不当损坏了

The I2C signal pins of the ES7210 chip are damaged due to improper insertion and removal.

解决方法：

更换新板子，问题得到解决

Replace the board with a new one, and the problem is solved.

经验总结与启示

Experience Summary and Enlightenment

技术层面收获
Technical - level Gains

- 跨平台 EDA 工具协作经验
  Collaboration experience of cross - platform EDA tools
- 硬件调试技能提升
  Improvement of hardware debugging skills
- 生产工艺深入理解
  In - depth understanding of production processes
- 社区协作能力增强
  Enhancement of community collaboration ability

对开发者的建议
Suggestions for Developers:

- 选择适合的EDA工具Choose suitable EDA tools.
- 考虑工具兼容性Consider tool compatibility.
- 关注开源项目Pay attention to open - source projects.
- 参与技术社区Participate in technical communities.
- 理论与实践结合Combine theory with practice.

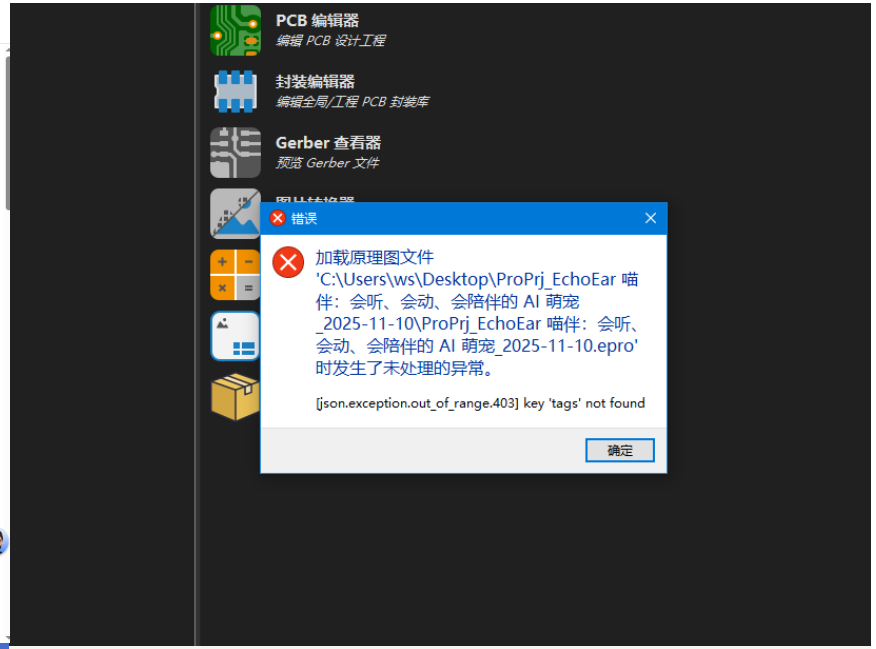
开源生态的核心价值

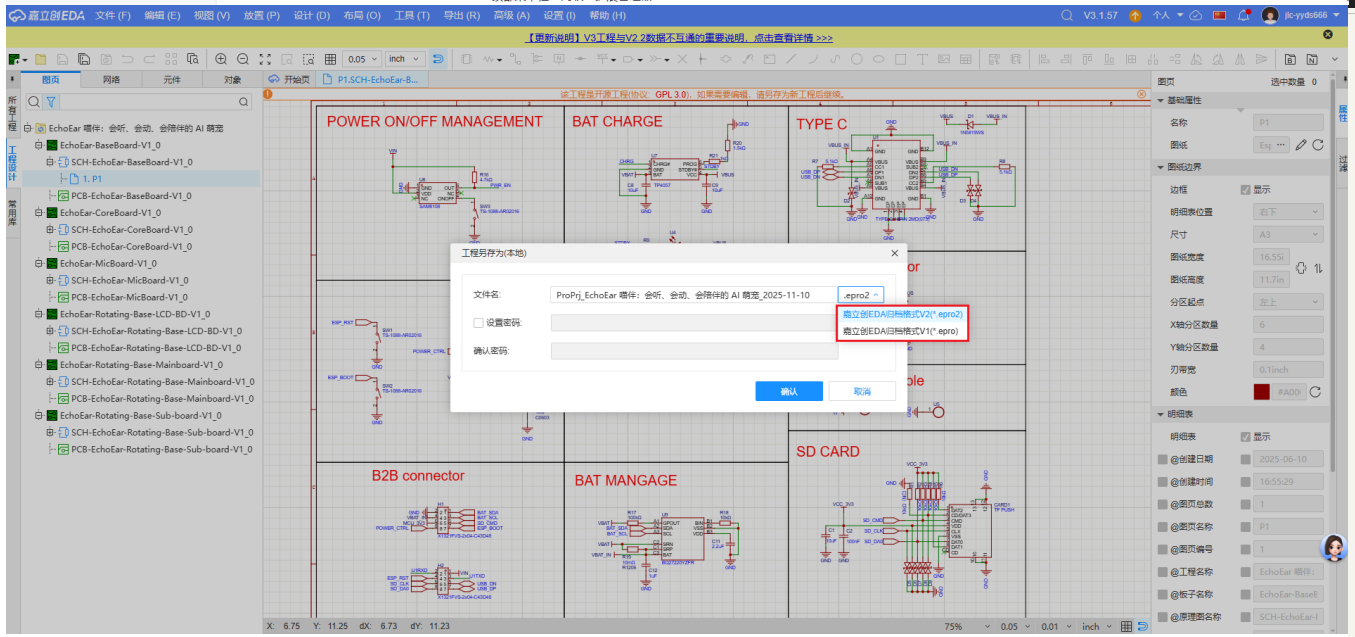
知识共享 Knowledge Sharing
智慧碰撞 Wisdom Collision
共同进步 Common Progress

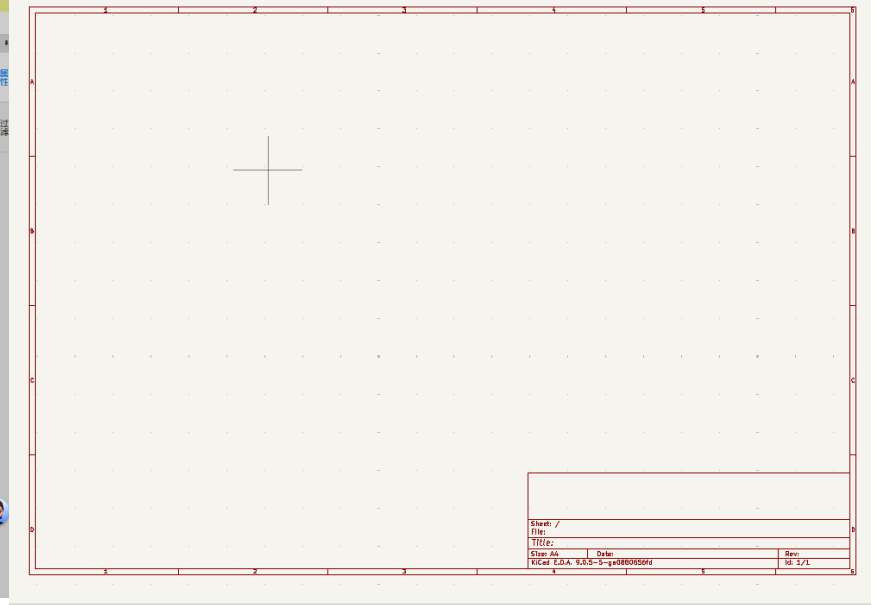
让我们一起，用技术的力量创造更美好的未来！

KiCad 华秋 www.huaqiu.com

谢谢大家！ Thank You!







详见网址：https://lceda001.feishu.cn/wiki/FPOuwqxIViyBWFk6wjNcEXmpn6b