



Intelligent sleep instrument

Body data collection, analysis and design process

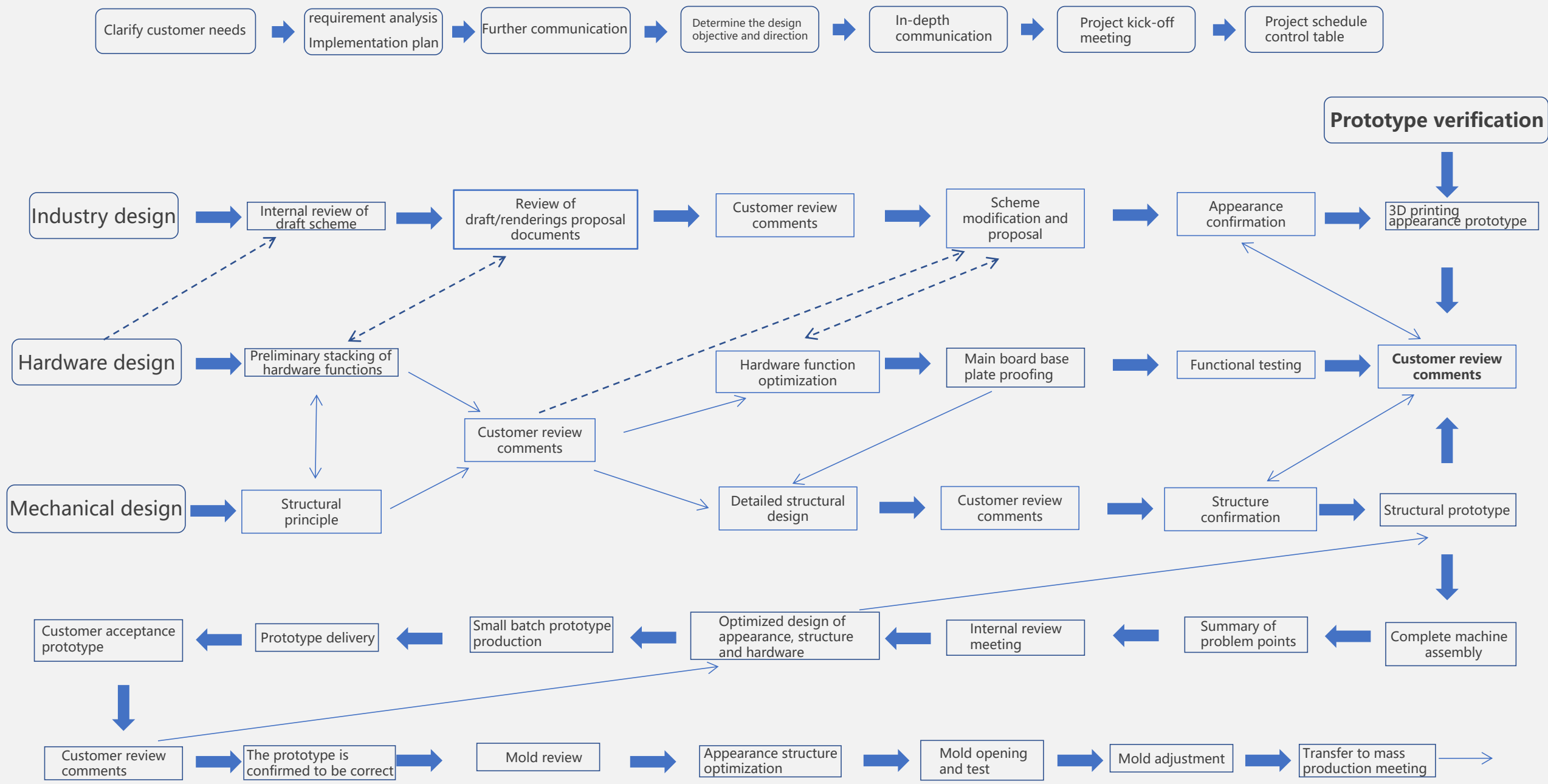
December 2021 to September 2022



CONTENTS

Sleep assistant

- 01** Design requirement analysis
设计需求分析
- 02** Hardware design
HD设计
- 03** Industry design
ID设计
- 04** Mechanical design
MD设计
- 05** Prototype verification
样机验证
- 06** Small-scale trial production
小批量试产



Project kick-off meeting



Market+HD+ID+MD+customer: all parties describe the project needs, clarify the key points of design needs, and initially reach the design direction.

Minutes of the meeting

触摸按键，按下时有低音量的提示音。				<p>会议名称：奥必眠宠项目软硬件需求评估及硬件方案确认</p> <p>会议时间 2022年4月18日 14:00-18:50 地点 大会议室 会议出席情况 现场参会：直捷结构（曾总-2人）、深圳几米硬件团队（陈总-2人）、音效方案团队（陆总-2人）、LED屏方案（梅总）、中科新团队（陈彦彬、吴三元） 请假 无 缺席 无 无 无</p> <p>会议内容</p> <p>一、会议过程： 1. 讨论和梳理奥必眠嵌入式软件、硬件需求，明确各方职责 2. 确认硬件PCB模块的集成内容，明确定义音箱内部PCB板数量 PCB板分为三大模块：  几米团队负责：  音效方案团队负责：  3. 主控板与功放板通过一拖串联方式进行连接，减少连接线的数量</p> <p>二、各团队负责硬件相关事项</p> <p>音效方案团队 - 陆总： 1. 音效蓝牙模块硬件新增模块： (1) 数据接口：TypeC高速专线接口、MicroUSB 底座接口 (2) LED灯带位于音箱底部，由音效芯片集成LED灯带接口 (3) 温度传感器靠近底部，由音效芯片集成温度传感器 FPC 板接口 (4) 9820 串口用于连接单片机，剩余1个调试串口，几米团队建议LED屏接口由音效芯片控制 (5) 电源DC控制模块集成在音效芯片上，音效功放最大使用40W，由音效芯片进行电源分压处理。 (6) Flash存储卡：用于保存表情数据、周轮、编队音乐、呼吸引导音效、开机音效 软件功能： (1) 周轮状态接收、周轮播放 (2) 播放按钮、音量按钮、触摸按钮控制，分别作用于手机音乐播放和内置音乐播放</p> <p>(3) LED屏屏开动画读取，通过9820内部指令协议驱动功能表情 (4) 内置音乐列表播放功能（未讨论） (5) 蓝牙配网认证方案待确定</p> <p>LED屏方案 - 梅总： 1. 提供LED屏表情驱动协议 2. 提供LED屏硬件参数资料 3. led屏亮度控制分为6档：0（关闭）、20%、40%、60%、80%、100% 4. 几米评估0603系列呼吸灯带效果可能不太理想，需要挑选另外的呼吸灯带型号</p> <p>几米硬件团队 - 陈总： 1. 主控按钮、指示灯、距离传感器集成在9820主控板上 2. 提供温度传感器 FPC 板原理图 3. 提供按钮 PCB 板原理图；集成播放按钮、音量按钮、触摸按钮 4. 9820主控板通过SPI、I2C接口进行数据指令通讯 5. 单片机与音效蓝牙增加蓝牙死机监控通讯</p> <p>直捷结构 - 曾总： 1. 跟奥必需求方确认音效蓝牙只支持单音源播放功能，需要修改小程序呼吸引导功能定义 2. 跟奥必需求方确认表情数据、周轮、编队音乐、呼吸引导音效、开机音效等音频数据存储在音效功放上，后续升级难度大，不支持在线更新内置音频资源，内置音频数据出厂后无法修改 3. 跟奥必需求方确认LED屏表情内容输出 4. 跟奥必需求方确认音效蓝牙配对方案，初次连接是否需要连接验证 5. 结构中明确温度传感器开口位置、大小，提供完整的音箱结构文件 6. 结构中明确温度传感器位置位置，提供完整的音箱结构文件 7. 结构中独立出音效功放PCB的放置整体，提供完整的音箱结构文件 8. 电源适配参数确认15V、3.5A、DC接口3.5mm，提供电源适配器选型</p> <p>中科新团队： 1. 重新细化嵌入式软件、硬件需求说明 2. 梳理音效蓝牙软件功能 3. 评估上述硬件方案</p>
触摸按键，按下时有低音量的提示音。		1. 除左侧功能外，其他时间是否为熄灭状态？	1. 除左侧3点功能外，其他时间是否为熄灭状态？	
触摸按键，按下时有低音量的提示音。	1. 是否需要小程序控制音箱音量？			
1、触摸按键，按下时有低音量的提示音。 2、蓝牙匹配连接需做认证。音箱上按下蓝牙按钮，蓝牙进入从设备模式（蓝牙可被发现），持续3分钟，同时led灯显示蓝牙表情。蓝牙匹配成功时提示“蓝牙已连接”，同时停止显示蓝牙表情。		1. 颜色是否软件可调？ 2. 由哪三色进行混合？	1. 颜色是否软件可调？ 2. 由哪三色进行混合？	
---	1. 颜色保持跟现有悠护4G一致 2. 亮度调暗50K 3. 通电2Hz，mcu启动后转为1Hz（现有4G逻辑）	1. 需由结构确定位置	1. 需由结构确定位置	
---		1. 蓝牙必须集成在功放板上还是可以由几米硬件团队进行设计评估	1. 蓝牙必须集成在功放板上还是可以由几米硬件团队进行设计评估	
---		1. 需要确认摸耳朵的覆盖面	1. 需要确认摸耳朵的覆盖面	
去掉光敏传感器，功能按键指示灯固定低亮度。				
---	信号线颜色确认？			
---	由几米硬件团队确认适配器功耗			
与type-c数据采集接口共用		1. 是否需要小程序控制音箱音量？	1. 是否需要小程序控制音箱音量？	

Improve the design requirements according to the communication content of the meeting, and provide reference for the subsequent design concept.

Project schedule control table

奥铂电竞 项目进度表						
编制人: 曾敬新		审批人: 王子宙		编号: LJ-PJ-20230002		更新日期: 2023/6/8
编制日期: 2023/3/1		审批日期: 2023/3/1		版本号: 1.0		
项目名称	工期	预计起止时间	计划完成时间	责任人	完成情况	备注
眠宠	164个工作日 (124自然日)	2023/3/1	2023/6/18	曾敬新	进行中	目标
A 项目输入阶段 (责任人:)	7 个工作日	2023/3/1	2023/3/9	曾敬新		
1 《需求说明书》	1	2023/3/1	2023/3/1		√	文件类
2 《需求规格书》及逻辑功能树图设计	1	2023/3/2	2023/3/2		√	
3 《需求规格书》	1	2023/3/3	2023/3/3		√	
4 《需求规格书》评审	1	2023/3/4	2023/3/4		√	
5 《需求规格书》	1	2023/3/7	2023/3/7		√	
6 需求会议	1	2023/3/8	2023/3/8		√	
7 需求规格书评审及评审	1	2023/3/8	2023/3/8		√	
B 软硬件设计开发阶段	54 工作日	2023/3/1	2023/6/18	广州新物/奥铂		
1 软硬件需求规格书	1	2023/3/1	2023/3/1	广州新物/奥铂	√	可研中/更新确认/节录
2 硬件方案架构设计	1	2023/3/2	2023/3/2	广州新物/奥铂	√	
3 硬件方案详细设计评审	1	2023/3/3	2023/3/3	广州新物/奥铂	√	
4 硬件方案详细设计评审	1	2023/3/4	2023/3/4	广州新物/奥铂	√	
5 硬件方案详细设计	8	2023/3/7	2023/3/11	广州新物/奥铂	√	
5.1 150V直流屏设备需求设计	1	2023/3/8	2023/3/8	外部, 林义明, 曾敬新	√	
5.2 150V直流屏控制	2	2023/3/8	2023/3/8	曾敬新 (软件部分)	√	
5.3 服务器机柜系统架构	3	2023/3/7	2023/3/7	曾敬新 (软件部分)	√	
6 硬件方案详细设计评审	1	2023/3/14	2023/3/14	曾敬新	√	
7 硬件方案详细设计评审	1	2023/3/15	2023/3/15	曾敬新 (软件部分)	√	
8 硬件方案详细设计	1	2023/3/16	2023/3/16	林义明, 曾敬新	√	
9 硬件方案详细设计评审	1	2023/3/17	2023/3/17	曾敬新	√	
10 硬件方案详细设计评审	1	2023/3/18	2023/3/18	林义明, 曾敬新	√	
11 硬件方案详细设计	3	2023/3/21	2023/3/23	林义明, 曾敬新	√	
12 硬件方案详细设计评审	1	2023/3/24	2023/3/24	曾敬新	√	
13 硬件方案详细设计评审	2	2023/3/25	2023/3/25	林义明, 曾敬新	√	
14 硬件方案详细设计				曾敬新 (软件部分)		
15 硬件设计评审				曾敬新 (软件部分)		
16 服务器机柜				林义明, 曾敬新		
17 服务器机柜的维护/管理				曾敬新, 曾敬新		
18 服务器机柜				曾敬新, 曾敬新		
19 服务器机柜				曾敬新, 曾敬新		
20 服务器机柜				曾敬新, 曾敬新		
21 服务器机柜的维护/管理	15	2023/3/25	2023/6/15	曾敬新, 曾敬新		
22 服务器机柜的维护/管理	1	2023/3/18	2023/3/18	曾敬新, 曾敬新		
23 服务器机柜	3			曾敬新		
24 服务器机柜的维护/管理	3			林义明, 曾敬新		
25 服务器机柜	1			林义明, 曾敬新, 曾敬新		
C 网络设计开发阶段	14 工作日	2023/3/1	2023/3/29	曾敬新		
1 网络架构设计	1	2023/3/1	2023/3/1	曾敬新, 曾敬新	√	最少需要方案
2 网络架构设计	1	2023/3/2	2023/3/2	曾敬新, 曾敬新	√	
3 网络架构设计	3	2023/3/3	2023/3/8	曾敬新, 曾敬新	√	
4 评审	1	2023/3/8	2023/3/8	曾敬新	√	
5 18外联设备	1	2023/3/10	2023/3/10	曾敬新, 曾敬新	√	
6 18外联设备	1	2023/3/11	2023/3/11	曾敬新, 曾敬新	√	
7 评审	1	2023/3/14	2023/3/14	曾敬新	√	
8 18外联设备	1	2023/3/15	2023/3/15	曾敬新, 曾敬新	√	
9 18外联设备	1	2023/3/16	2023/3/16	曾敬新, 曾敬新	√	
10 18外联设备	1	2023/3/17	2023/3/17	曾敬新	√	
11 需求分析及设计评审	10	2023/3/19	2023/3/1	曾敬新	√	
12 需求分析及设计评审	8	2023/3/2	2023/3/9	曾敬新/曾敬新	√	
13 需求分析及设计评审	2			曾敬新	√	
14 需求分析及设计评审	1			曾敬新	√	
15 需求分析及设计评审	1			曾敬新	√	
D1 结构体设计开发阶段	15 工作日	2023/3/1	2023/4/25	曾敬新		
1 《结构体设计书》	1	2023/3/1	2023/3/4	曾敬新/曾敬新	√	
2 《结构体设计书》评审	1	2023/3/7	2023/3/7	曾敬新/曾敬新	√	
3 结构体设计书	1	2023/3/8	2023/3/8	曾敬新/曾敬新	√	
4 《结构体设计书》评审/10设计评审	5	2023/4/6	2023/4/11	曾敬新/曾敬新	√	
5 《结构体设计书》评审	1	2023/4/19	2023/4/19	曾敬新/曾敬新	√	
6 结构体设计书	1	2023/4/14	2023/4/14	曾敬新/曾敬新	√	
7 结构体设计书	1	2023/4/15	2023/4/15	曾敬新/曾敬新	√	
8 结构体设计书/10设计评审	3	2023/4/18	2023/4/20	曾敬新/曾敬新	√	

D2	音视频设计开发阶段	80 工作日	2023/3/15	2023/3/31	曾敬新	
1	音视频需求设计	4	2023/3/15	2023/3/18	曾敬新	√
1.1	音视频需求设计A	4	2023/3/15	2023/3/18	曾敬新, 曾敬新, 曾敬新	√
1.2	音视频需求设计B	4	2023/3/18	2023/3/18	曾敬新, 曾敬新, 曾敬新	√
2	音视频需求设计	6	2023/3/21	2023/3/28	曾敬新, 曾敬新, 曾敬新	√
3	音视频需求设计	3	2023/3/29	2023/3/31	曾敬新, 曾敬新, 曾敬新	√
4	音视频需求设计评审	1	2023/3/31	2023/3/31		√
5	音视频需求设计评审	10	2023/4/1	2023/4/18		√
6	音视频需求设计	6	2023/4/1	2023/4/11	曾敬新, 曾敬新	√
7	音视频需求设计	14	2023/4/12	2023/5/2		√
8	音视频需求设计	5	2023/5/3	2023/5/8		√
9	音视频需求设计	5	2023/5/10	2023/5/16		√
10	音视频需求设计	6	2023/5/17	2023/5/24		√
11	音视频需求设计	4	2023/6/7	2023/6/10		√
12	音视频需求设计	3	2023/6/13	2023/6/18		√
13	音视频需求设计	2	2023/6/16	2023/6/17		√
14	音视频需求设计	2	2023/6/20	2023/6/21		√
15	音视频需求设计	1	2023/6/22	2023/6/23		√
E 结构开发阶段	34 工作日	2023/6/21	2023/8/19	曾敬新		
1	结构开发需求	2	2023/6/21	2023/6/22		√
2	结构开发需求	2	2023/6/23	2023/6/24		√
3	结构开发需求	20	2023/6/27	2023/7/22		√
4	结构开发需求	5	2023/7/25	2023/7/25		√
5	结构开发需求	5	2023/8/1	2023/8/8		√
6	结构开发需求	3	2023/8/15	2023/8/17		√
7	结构开发需求	2	2023/8/18	2023/8/19		√
F 样机制作阶段	18 工作日	2023/6/22	2023/7/15	曾敬新/奥铂/中创		更新计划
1	样机制作需求	1		曾敬新-点理		√
2	样机制作需求	1		曾敬新-点理		√
3	样机制作需求	1		曾敬新-点理		√
4	样机制作需求	10		曾敬新/曾敬新		√
5	样机制作需求	10		曾敬新/曾敬新		√
6	样机制作需求	7		曾敬新		√
G 生产阶段	22 工作日					计划阶段待确认
1	生产阶段需求					√
1.1	生产阶段需求					√
2	生产阶段需求					√
2.1	生产阶段需求					√
2.2	生产阶段需求					√
3	生产阶段需求					√
3.1	生产阶段需求					√
4	生产阶段需求					√
4.1	生产阶段需求					√
4.2	生产阶段需求					√
4.3	生产阶段需求					√
5	生产阶段需求					√
5.1	生产阶段需求					√
5.2	生产阶段需求					√
6	生产阶段需求					√
6.1	生产阶段需求					√
6.2	生产阶段需求					√
6.3	生产阶段需求					√
7	生产阶段需求					√
7.1	生产阶段需求					√
7.2	生产阶段需求					√
7.3	生产阶段需求					√

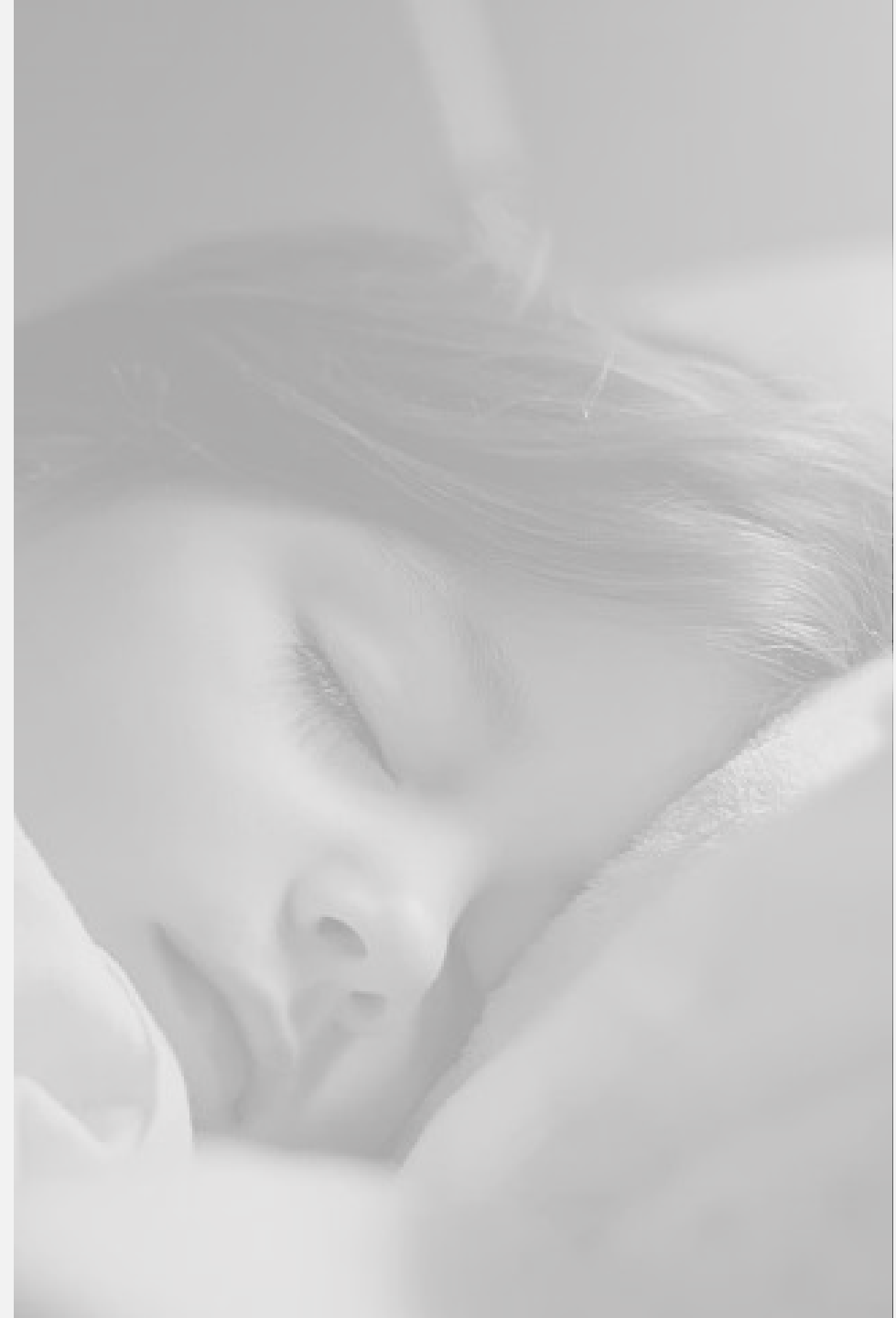
According to the design requirements, formulate a detailed work plan and the task allocation of each department in the subsequent stages to ensure that the project is carried out in an orderly manner according to the plan.

01

Design requirement analysis

设计需求分析

This is the beginning of all design activities. This stage can be divided into two steps: accepting projects, making plans, conducting market research and finding problems. The designer first accepts the design entrustment of the client, and then the client, designer, engineer and relevant experts form a project team. The development of a detailed design plan, market research and problem finding are the basis of all design activities. Any good design is based on the actual demand and market demand.



Market introduction

Establishing a personalized health model is an inevitable outcome in the context of the era of great health



Communicate with customers through email, telephone and video conference to initially understand customer needs, and let customers understand Blue Whale's business, as well as Blue Whale's preliminary understanding of the project and corresponding solutions.

Market research

— 、 Through the information provided by the customer and the in-depth understanding of the market by the departments and teams, and find problems according to the actual situation.



Bracelet

Combined with mobile phone operation and wrist wear

Active measurement requires click operation and home use

Sleep zone

Connect Tmall Genie, non-contact and sensorless sleep, household

Wrist sleep monitoring

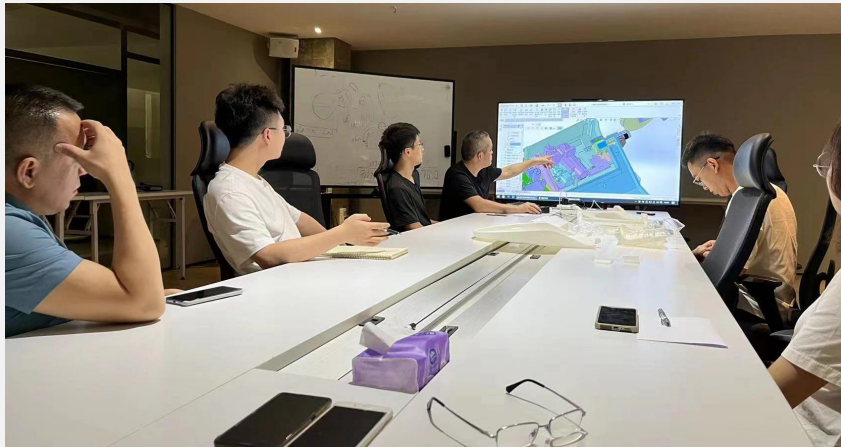
Combined with mobile phone operation

Contact wear

Sleeping pet mini

Individualized health model, non-contact senseless household, medical treatment, institutions

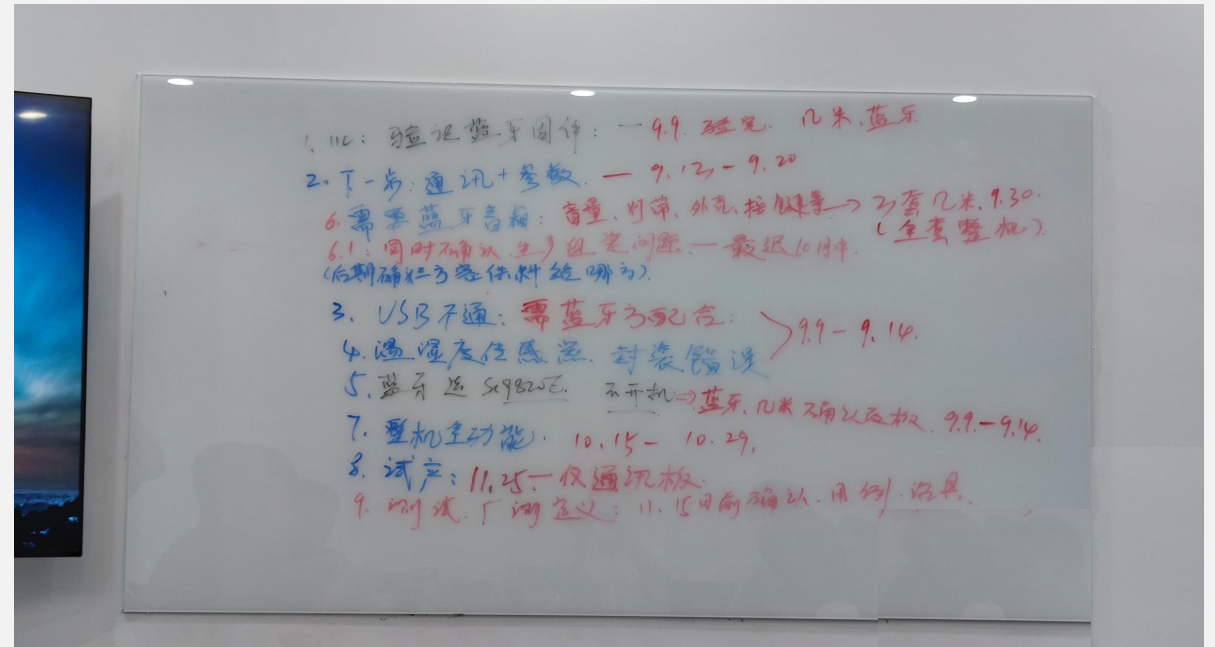
Technical workshop



— 、 The key and difficult points in the design are analyzed and the corresponding solutions are discussed.

— 、 The allocation of the subsequent design content is optimized again for the corresponding work time of each time period.

Summary of design direction

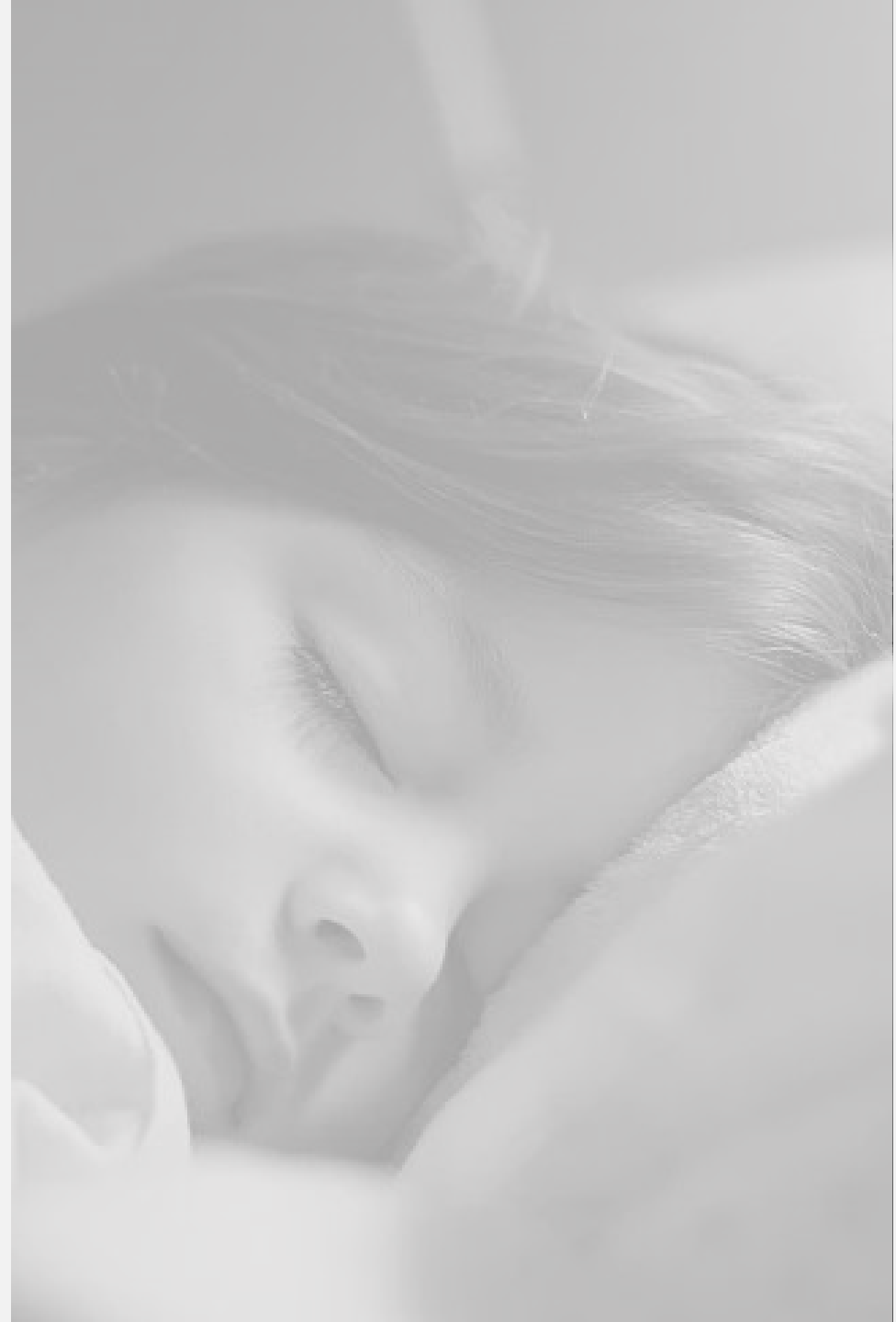


According to the contents of the technical seminar jointly attended by all departments, the basic direction of design is summarized.

02

Hardware design

H D 设计

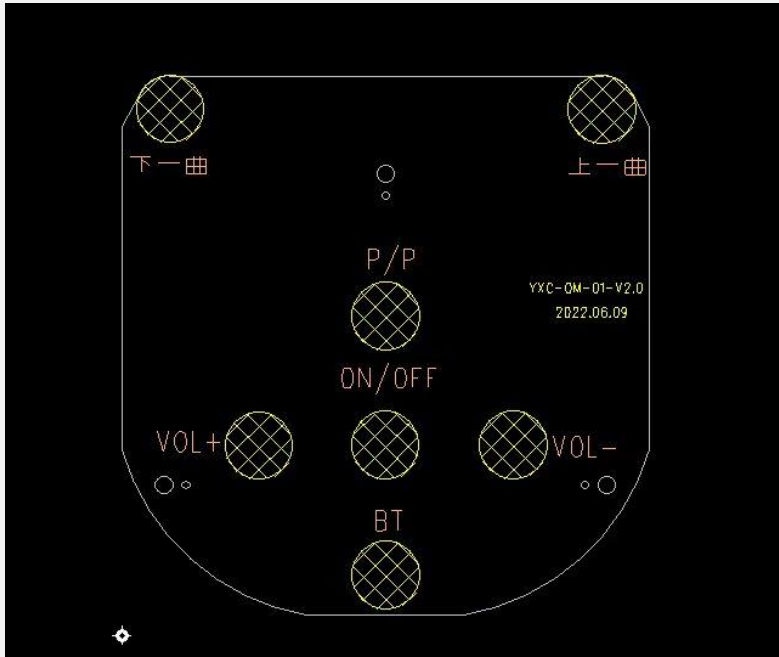


Functional requirement

硬件模块	基础功能需求	2025.05.10 基础功能需求			
LED灯组罩等	硬件规格: 一块屏等35x70mm (点阵数量为 12*24=288, 颜色为单白色) 功能需求: 1. 开机显示动态表情 2. 有报告时, 根据报告得分显示相应的表情, 显示5分钟 3. 断网或其它故障时(无网络和信号线信号弱)指示灯不做提示, 只做表情提示, 0:00-6:00不显示故障功能表情。		蓝牙设备		1. 表情报错, 按下时有低音量的提示音。 2. 蓝牙匹配连接需做认证, 音箱上按下蓝牙按键, 蓝牙进入从设备模式(蓝牙可被发现), 持续3分钟, 同时led灯组显示蓝牙表情, 蓝牙匹配成功时提示:“蓝牙已连接”, 同时停止显示蓝牙表情。
呼吸灯带	1. 三色灯(混合成单色-暖白色), 呼吸灯在底部发光, 显示为完整的灯圆 2. 呼吸模式-由强到弱, 以低频率软件可调		电源指示灯		
红外	1. 在顶部透光 2. 仅在闹钟响铃时, 启动红外光, 按一下取消闹钟	非接触测心率传感器, 取消按一下功能		1. 通电常亮 2. 亮度可调 3. 开音检测时常亮	
音乐蓝牙	1. 蓝牙集成在功放板上 2. 手机直接播放音乐 3. 小程序播放音乐				
耳朵触膜	1. 在两只耳朵上放置触膜片, 实现按左耳上一音, 按右耳下一音				
主控按键	1. 控制数据采集状态	表情报错, 按下时有低音量的提示音。			
播放按键	1. 控制音箱内音乐播放/暂停 2. 控制小程序上音乐播放/暂停	表情报错, 按下时有低音量的提示音。	光线传感器	非接触测环境光自动调整电源指示灯亮度	非接触测心率传感器, 非接触测心率灯回感系统调。
音量按键	1. 两个按键, 分别控制音量+、音量-	表情报错, 按下时有低音量的提示音。	信息采集线	1. 解决采集器上的插头松动出现信号微弱的情况。 2. 更美观。 3. 信号线长2m。	
蓝牙设备		1. 表情报错, 按下时有低音量的提示音。 2. 蓝牙匹配连接需做认证, 音箱上按下蓝牙按键, 蓝牙进入从设备模式(蓝牙可被发现), 持续3分钟, 同时led灯组显示蓝牙表情, 蓝牙匹配成功时提示:“蓝牙已连接”, 同时停止显示蓝牙表情。	电源适配器	1个电源适配器, 为整机供电。	
			usb数据接口		与type-c数据采样接口共用

Determine the positioning, shape, function, etc. of the product

Preliminary layout of hardware functions

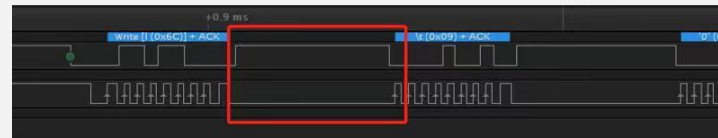


```

记录软件 x [?] Search Results
: #define WRITE_ADDRESS (0x36<<1) //0x6C
3: /* start*/
4: void scl_sda_start()
5: {
6:     SCL_OUT; //设置输出 把SCL设置高
7:     SDA_OUT; //设置输出 把SDA设置高
8:
9:     SCL_LOW //把SCL设置低
    
```

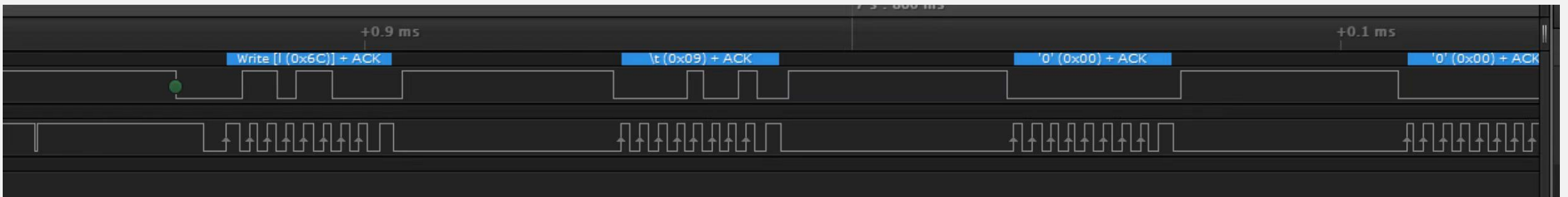
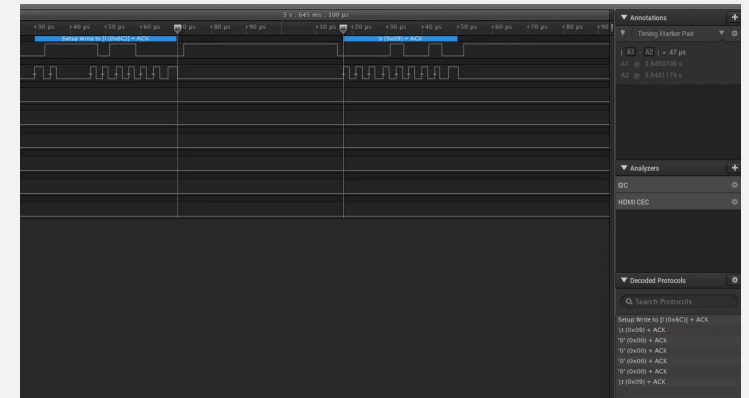
A

如: (NT821_XX_V01_220430)

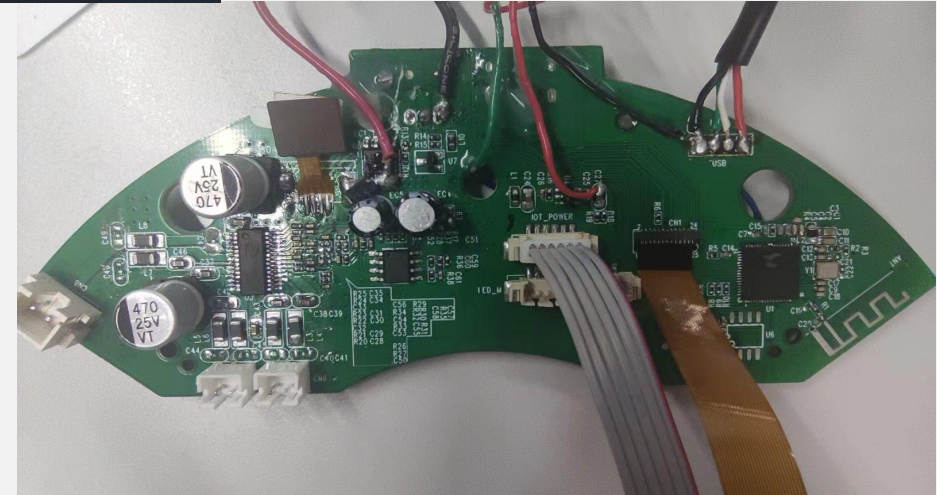
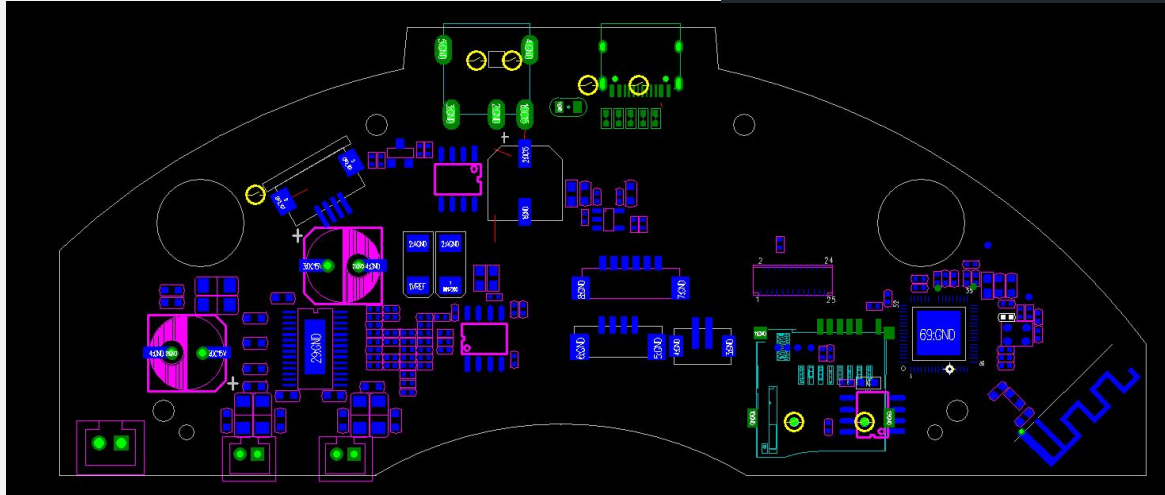
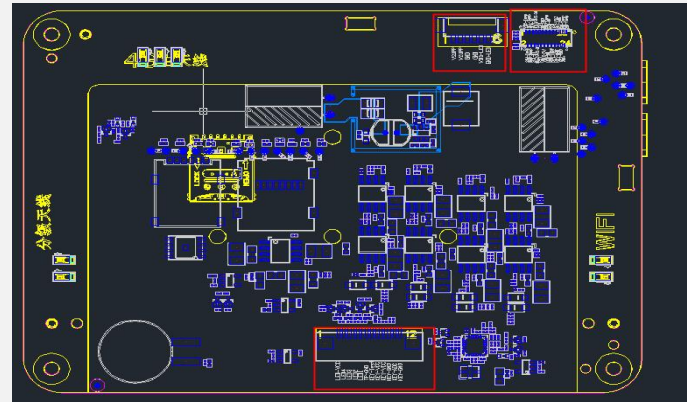
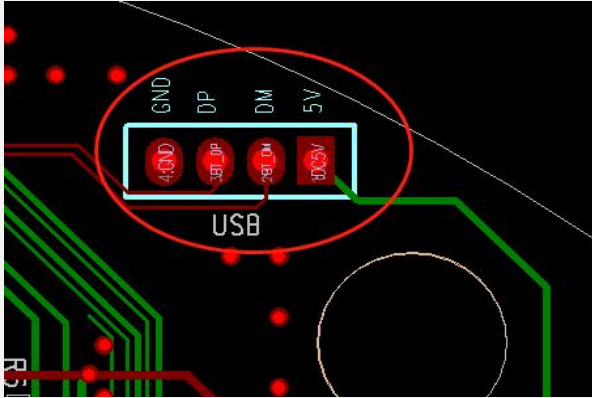


```

1000 07-07 00:00:00.300 001 3:352053 CI 0x4777 71027600 00000000 00000000 00000000 00000000
1001 07-07 00:00:00.300 001 3:352053 CI 0x4777 71027600 00000000 00000000 00000000 00000000
1002 07-07 00:00:00.300 001 3:352053 CI 0x4777 71027600 00000000 00000000 00000000 00000000
1003 07-07 00:00:00.300 001 3:352053 CI 0x4777 71027600 00000000 00000000 00000000 00000000
1004 07-07 00:00:00.300 001 3:352053 CI 0x4777 71027600 00000000 00000000 00000000 00000000
1005 07-07 00:00:00.300 001 3:352053 CI 0x4777 71027600 00000000 00000000 00000000 00000000
1006 07-07 00:00:00.300 001 3:352053 CI 0x4777 71027600 00000000 00000000 00000000 00000000
1007 07-07 00:00:00.300 001 3:352053 CI 0x4777 71027600 00000000 00000000 00000000 00000000
1008 07-07 00:00:00.300 001 3:352053 CI 0x4777 71027600 00000000 00000000 00000000 00000000
1009 07-07 00:00:00.300 001 3:352053 CI 0x4777 71027600 00000000 00000000 00000000 00000000
1010 07-07 00:00:00.300 001 3:352053 CI 0x4777 71027600 00000000 00000000 00000000 00000000
1011 07-07 00:00:00.300 001 3:352053 CI 0x4777 71027600 00000000 00000000 00000000 00000000
1012 07-07 00:00:00.300 001 3:352053 CI 0x4777 71027600 00000000 00000000 00000000 00000000
1013 07-07 00:00:00.300 001 3:352053 CI 0x4777 71027600 00000000 00000000 00000000 00000000
1014 07-07 00:00:00.300 001 3:352053 CI 0x4777 71027600 00000000 00000000 00000000 00000000
1015 07-07 00:00:00.300 001 3:352053 CI 0x4777 71027600 00000000 00000000 00000000 00000000
    
```

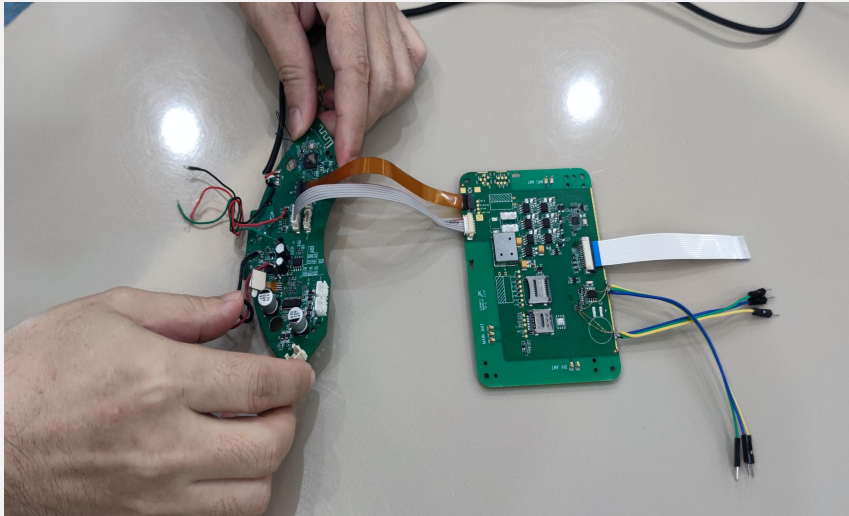
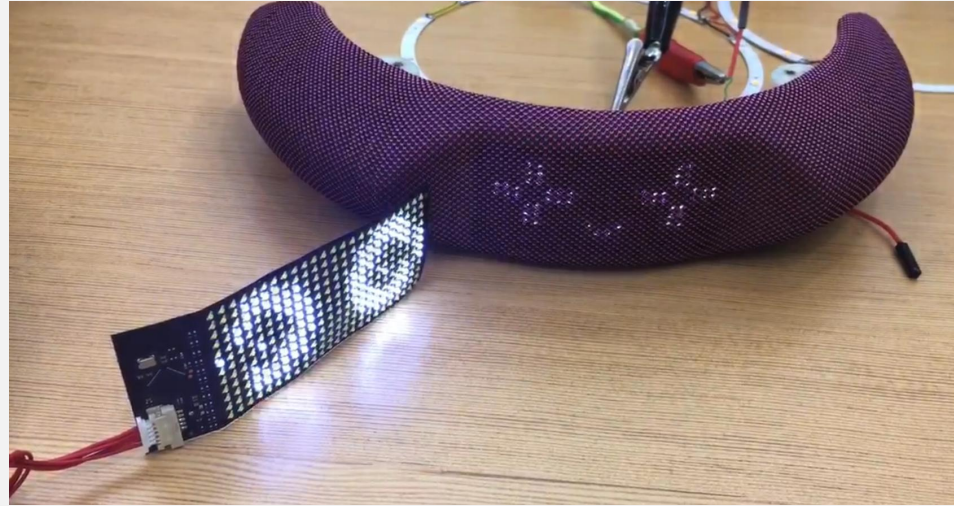


Detailed design



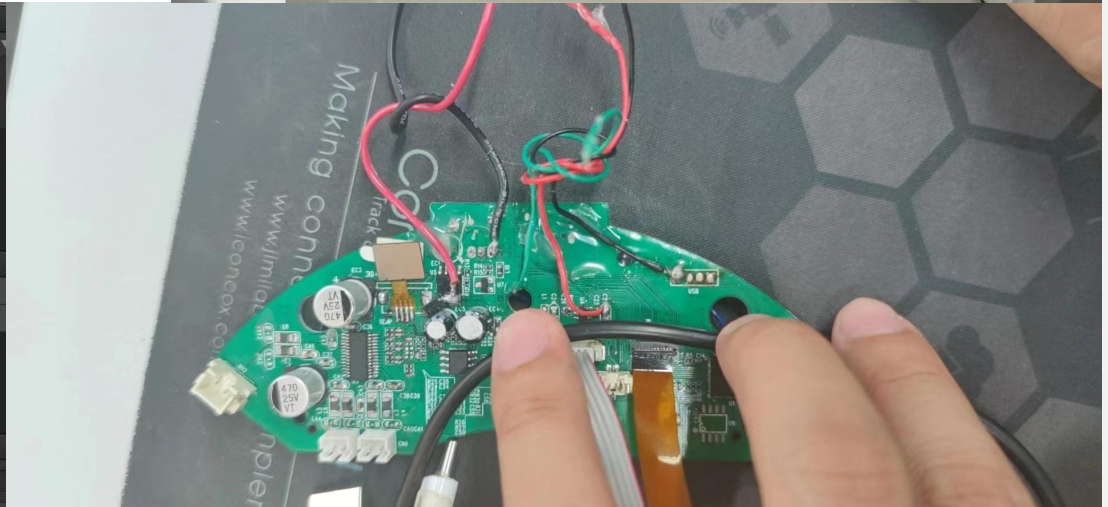
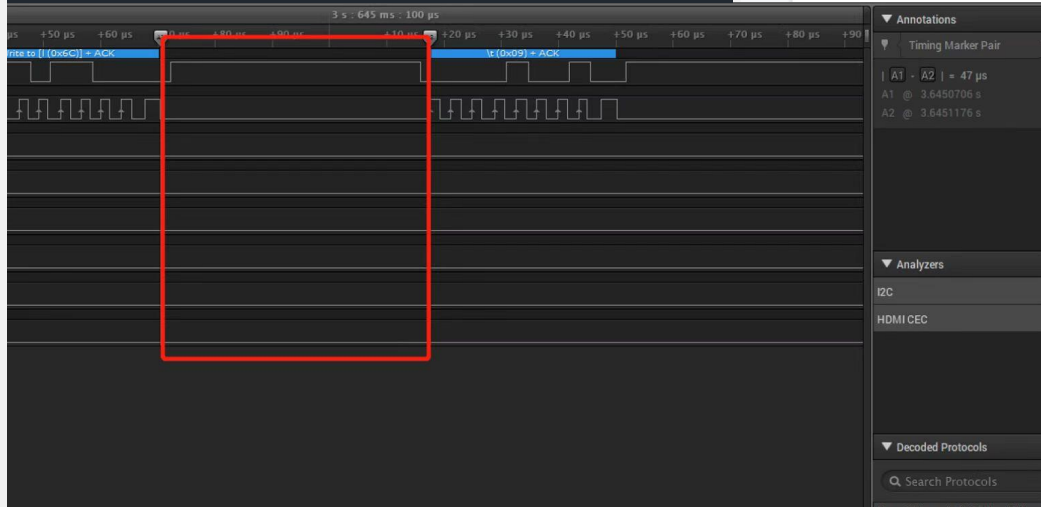
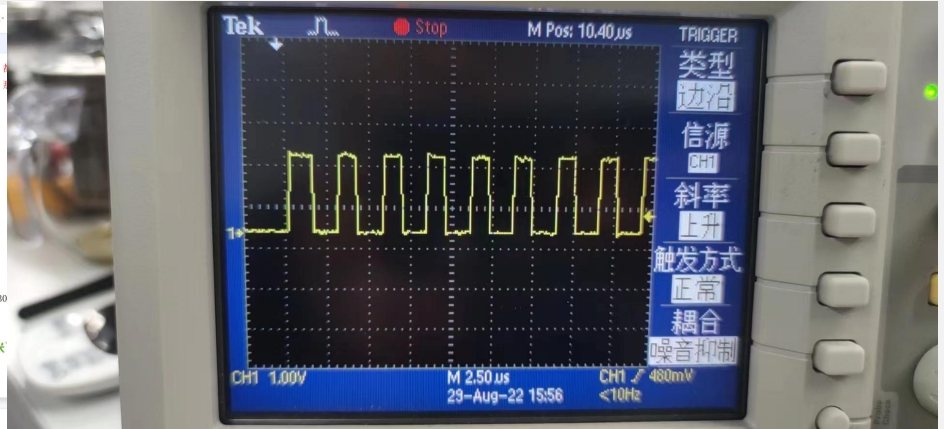
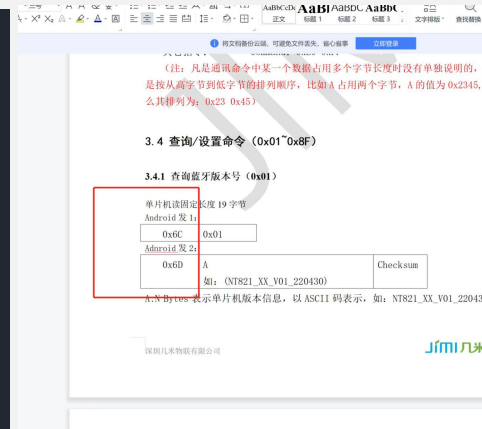
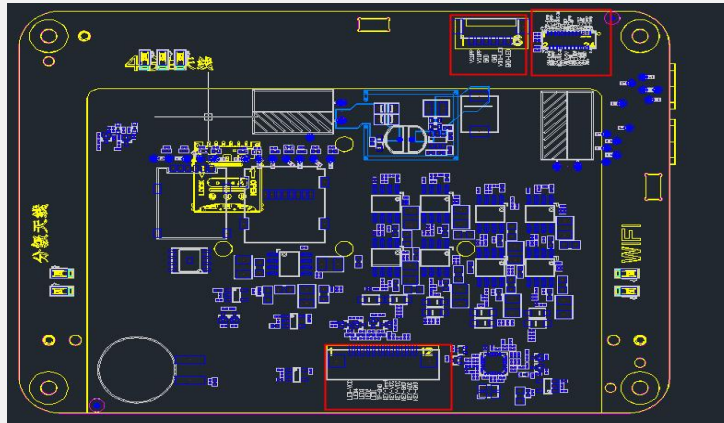
Detailed hardware design specification, schematic drawing review, assist in drawing PCB LAYOUT and BOM

Functional testing



Hardware debugging records, participating in relevant tests, obtaining test reports, absent repair and outputting relevant cases

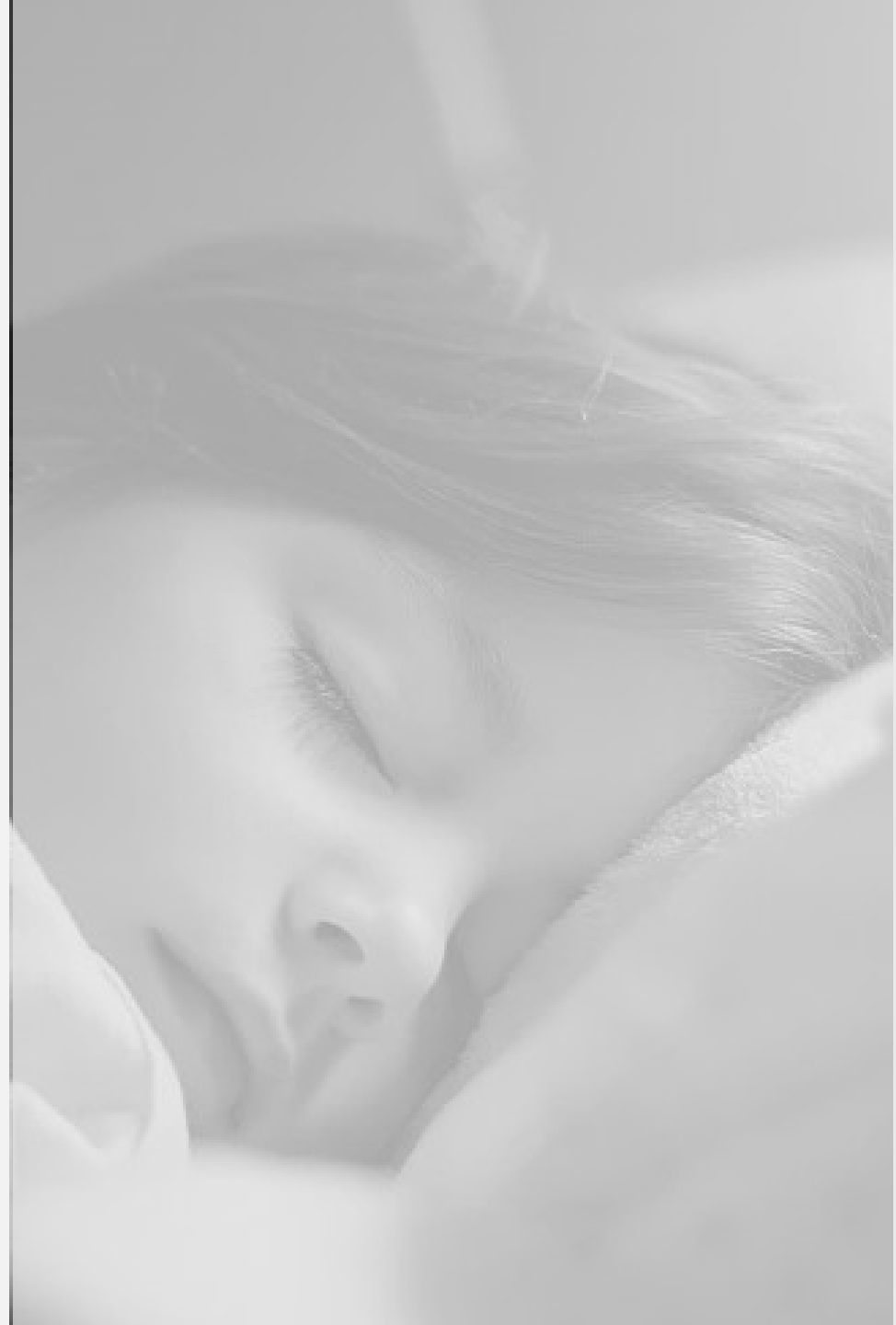
Hardware function optimization




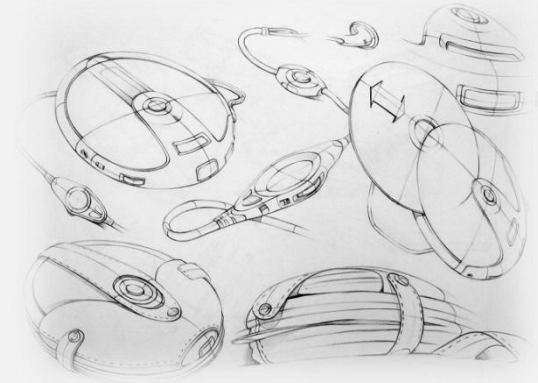
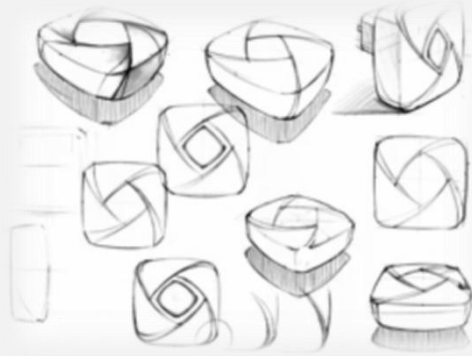
03

Industry design

外观设计



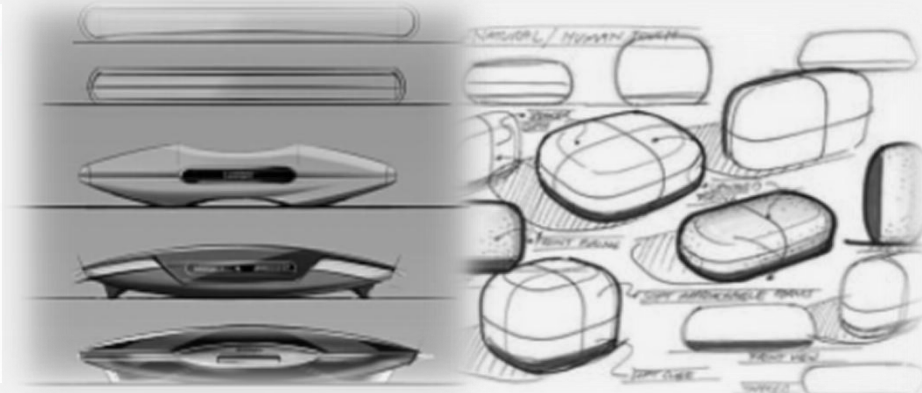
Sketch idea



- ラコナー型での回路設計に AC/DC 変換 (基板設計) とともに 部品選定 (部品選定)
- カメラを 魚眼化 (1.0-1.5mm) → LED 照明は 照明付
- カメラ (角度調整可能, 0-45°) を 本体取付け。
- 無線 VMS, LTE, Wi-Fi 接続は ラコナー型と同じ仕様
- カメラの 位置と向き (カメラ, 本体外形) を 大きく (カメラ) と 向き (向き) を 調整可能
- 入力配線は 本体背面引出 (カメラ) から
- 当然、製造規格等も

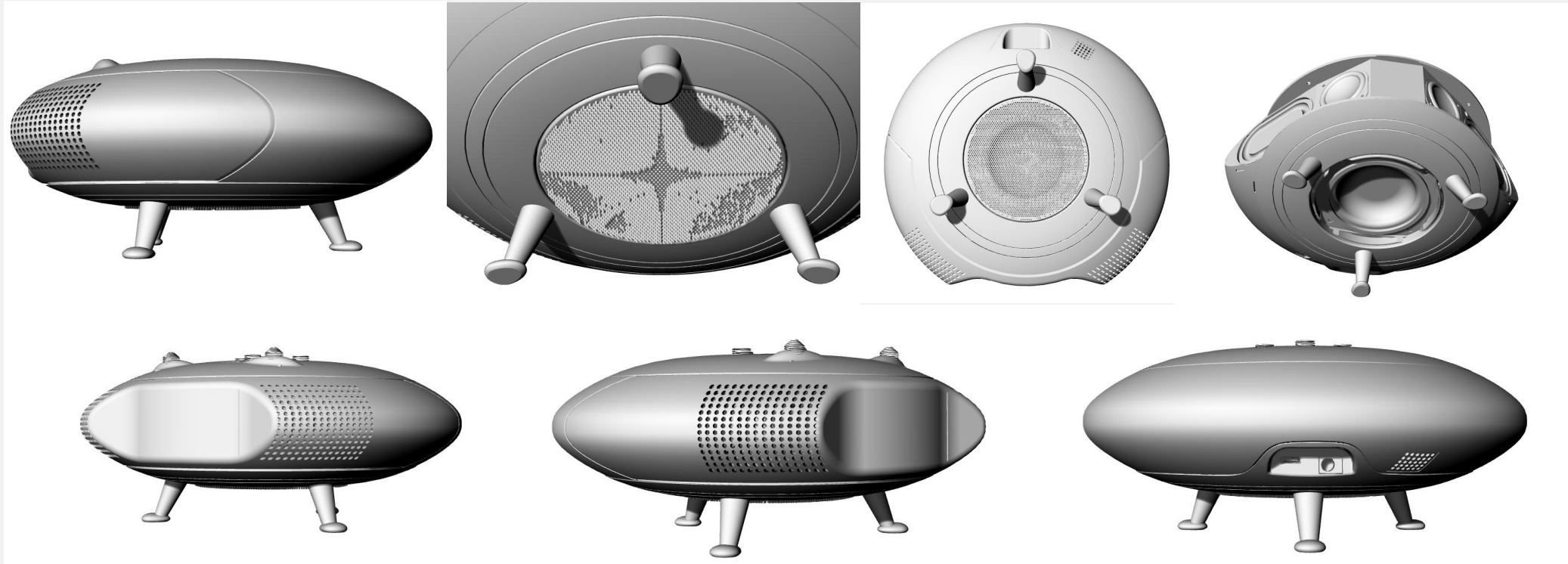
ラコナー型、本機型 の 外形 / 周辺部品 (取付け) 等も 加えて 図面

5/19 の 1/100 会議 1F に 前倒し 確認 した?



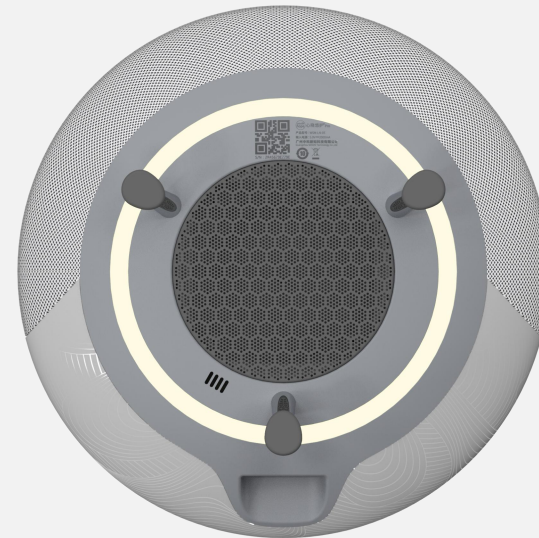
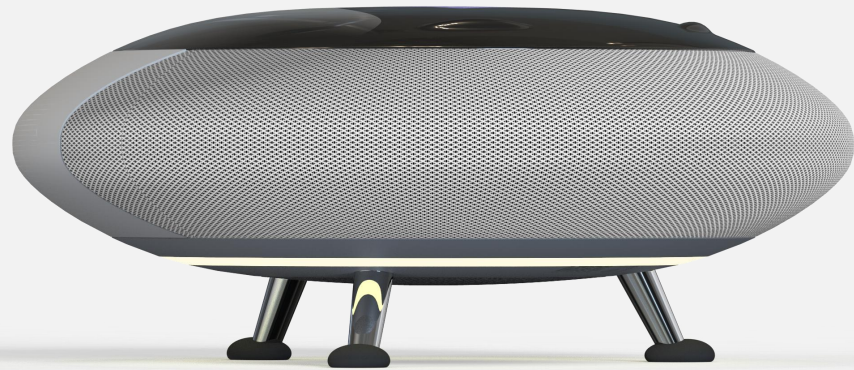
The appearance department, software and hardware department, structure department and other relevant personnel participate in the determination of product design direction and product size, including the realizability of products, materials, processing technology, structure mode, impact on functions and other relevant factors.

Appearance model



According to the comments and suggestions of the sketch review, the 3D model is constructed to provide new reference for the structure and hardware design.

Product rendering

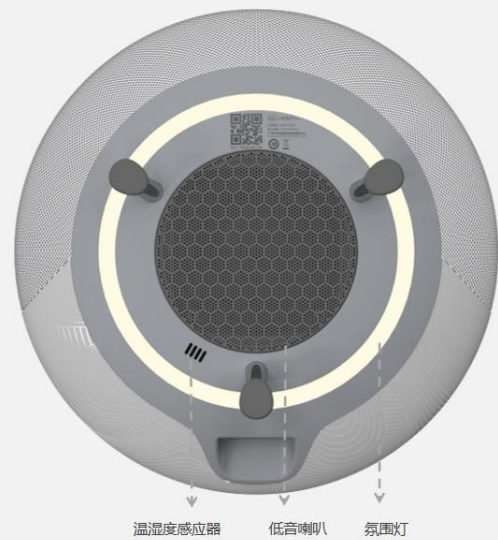
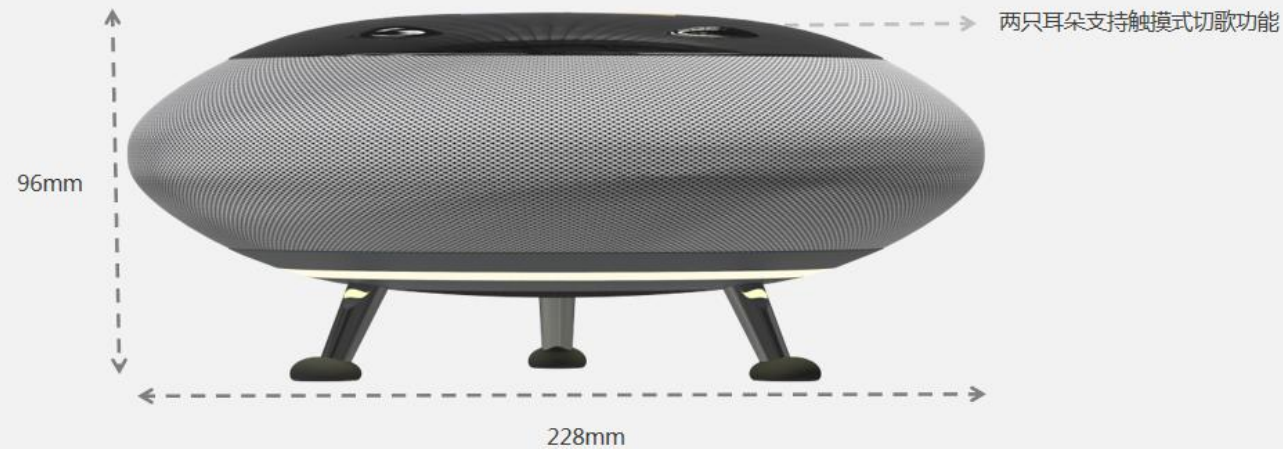


Appearance refinement



综合考虑相关因素对产品外观进行进一步完善，使产品更加接近实物状态。

Function distribution



Customer review



繁星

22/8/17

- 1、开机动画（直到系统启动完成 40-50S）
- 2、开机简短音乐播放
- 3、对MCU喂狗，10S 高低反向，若MCU检测到蓝牙死机会对其断电隔几秒再重新上电。
- 4、蓝牙通信
 - (1) 蓝牙版本
 - (2) LED屏设置
 - (3) LED灯亮度设置并呈现
 - (4) 音效设置
 - (5) 开机完成通知
 - (6) 闹钟 播放/停止
 - (7) 音箱音量设置，并生效
 - (8) 内置音乐喜欢设置，并生效
 - (9) 内置音乐播放控制，按设置序号播放
 - (10) 网络故障 提示（无网络、信号差），根据指令能提示
 - (11) 报告通知，根据指令设置，显示对应动画表情（高兴、难过、激动、等待检测报告等）
- 5、连接手机APP,通过蓝牙播放音乐（闹钟音乐、背景音乐等）
- 6、实体键功能，音乐播放过程中（播放、暂停、音量+、音量-）
- 7、触摸按键，音乐播放过程中（上一曲、下一曲）
- 8、蓝牙发现模式，蓝牙匹配过程中、蓝牙连接成功、蓝牙匹配失败对应提示音或屏显
- 9、屏显时间
 - (1) 网络故障表情显示，0-6点不显示，其他时间一直显示
 - (2) 报告生成表情显示5分钟
 - (3) 蓝牙匹配表情显示3分钟

- 测试固定最大数据为 8 个字节
第一个默认地址，读另外 7 个字节现在默认数据 0xA5, 0x85, 0x55, 0x62, 0x67, 0x89, 0xA0;
1. SCL 与 SDA 起始： SCL 与 SDA 同时为低电平时间范围(750us~2ms)之间为起始。
 2. 读数据 一个字节 8bit SCL 高低的时间不能小于 150us，高不能大于 2ms
SCL 为低电平时稳定 SDA 的数据，SCL 为高电平，读取 SDA 的数据，
 3. 写数据 一个字节 8bit SCL 高低的时间不能小于 150us，高不能大于 2ms
SCL 为低电平时稳定 SDA 的数据，SCL 为高电平，读取 SDA 的数据，
 4. 结束 SCL 高电平低于 1ms 数据读写结束。



陈星-中科新知

结论:

- 1.蓝牙全功能列表和对应说明及对应的软件版本提供时间，今晚8点回复
 - 2.I2C测试确认后10pcsPCBA可提供的时间周期
- @陆其岳

目前整体的软件开发和硬件部分的天线调试这个问题是瓶颈了，请内部集中资源重点处理下，谢谢@陆其岳 @Robin. 李YDW

心晓音箱（手板二版）		瓶子	
序号	问题点_20220824	序号	问题点_20220824
1	弧形外壳与主控件的螺丝孔无密封。	1	蓝牙版的温度传感器用错了。
2	扬声器位置结构： 1. 外壳无定位，打胶水向外溢胶； 2. 内圆小，与扬声器孔位干涉。		
3	高音喇叭位置结构： 1. 无定位，且螺丝孔不对齐。 2. 螺丝孔面与喇叭孔面接触不接触。 3. 固定螺丝松了，力度不够。 4. 螺丝孔无密封。 5. 此类喇叭金属易变形，不易密封。 6. 大孔小了，要预留溢胶空间。 7. 出线孔如何密封？		
4	低音喇叭位置结构： 1. 螺丝头小了。 2. 大孔小了，要预留溢胶空间。 3. 此类喇叭金属易变形，不易密封。		
5	LED屏支架是否易拆卸？		
6	LED屏出线方式？		
7	两翼的出音孔方式是否影响音质，声学工程师是否评估了？		
8	两翼的四个锁螺丝位，螺丝孔强度不够，会变形，锁不紧。		
9	温度传感器被固定无定位？盖子如何密封？检查如螺丝头是否干涉？盖子取消防呆设计。		
10	蓝牙版的扬声器盖子口如何密封？		
11	大壳位与灯条干涉。		
12	灯罩防呆方式不明显，且与灯条焊点是干涉，胶泥不到位。		
13	管腔密盖的止口和螺丝位如何密封？		
14	顶盖与腔体的圆角扣位如何密封？		
15	所有硬碰硬的地方是否考虑了会不会产生噪音？		
16	大壳位与灯条干涉。		
17	蓝牙版与通讯板的过线孔小了。		
18	排线板锁螺丝时，瓶子会顶起来，建议加扣位顶压。		
19	与腔体碰穿的所有过线孔、扣位和螺丝孔，如何密封？		

Relevant personnel explain the design scheme to the customer in detail, answer the customer's questions, and arrange the next work in time after the appearance is determined.

Appearance confirmation



- 一、 Determine the final appearance according to various factors such as software and hardware department, structure and mold, as well as customer comments and suggestions.
- 二、 It provides a new reference for the adjustment of structure and hardware.

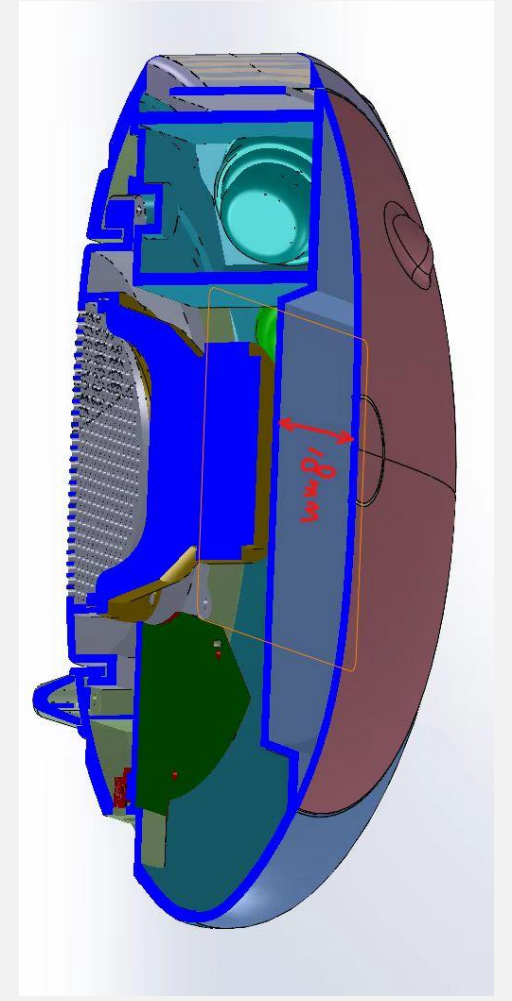
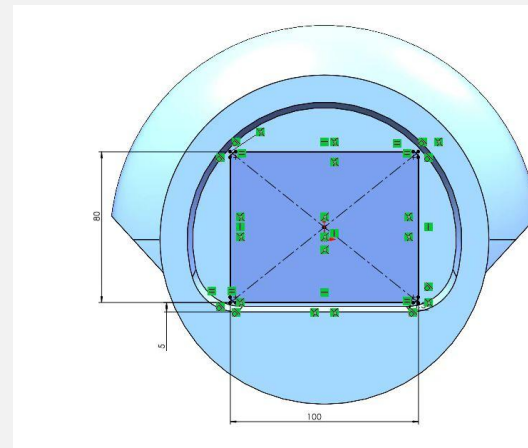
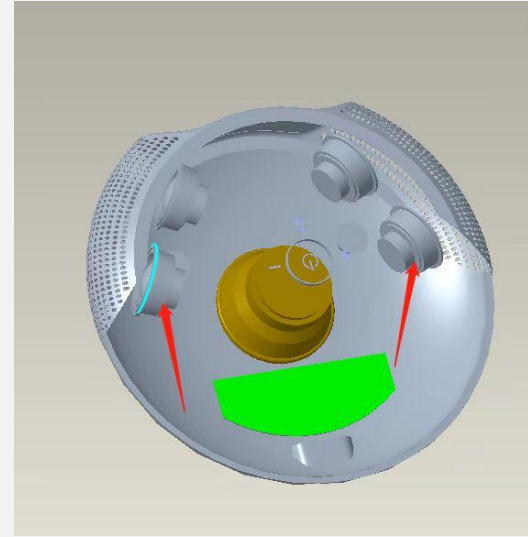
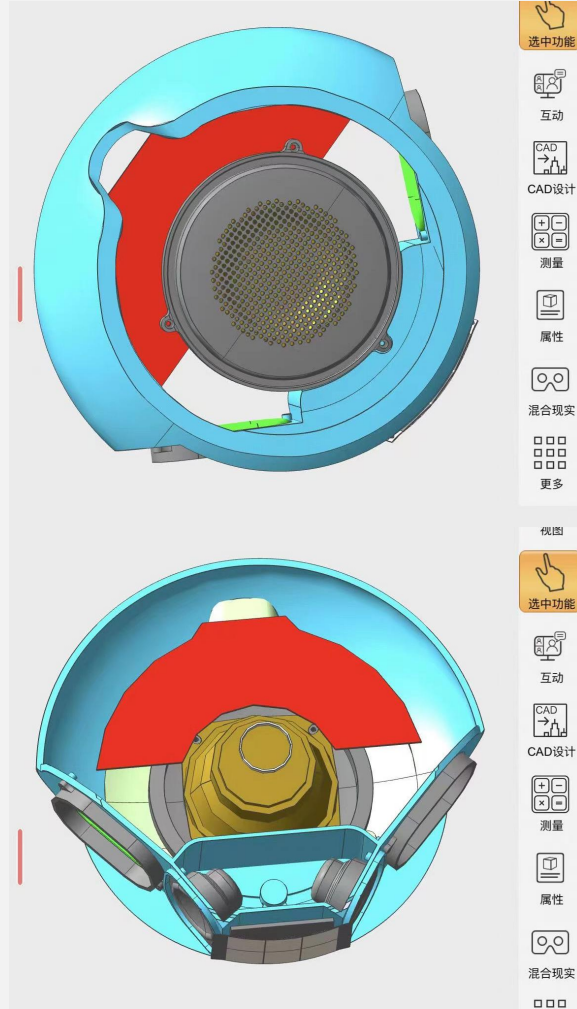
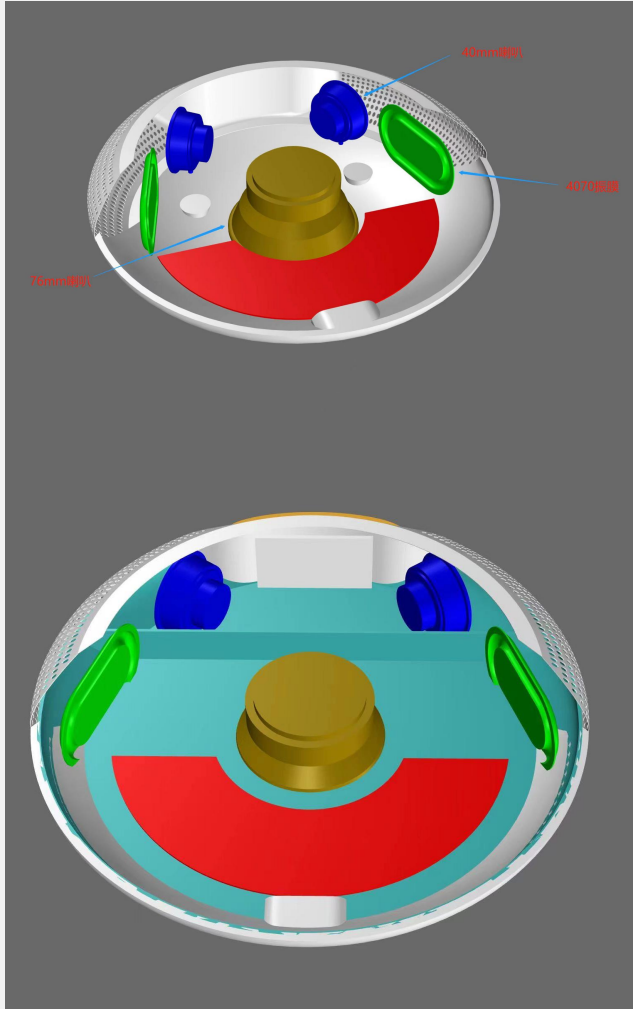
04

Mechanical design

M D 设计

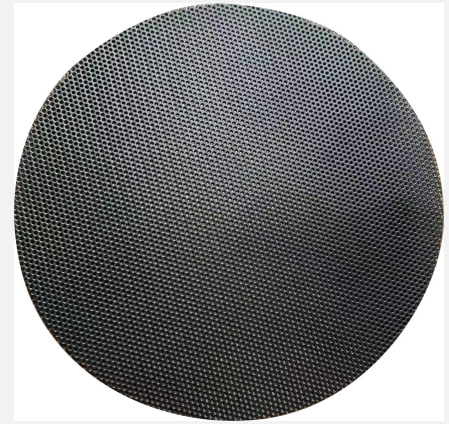
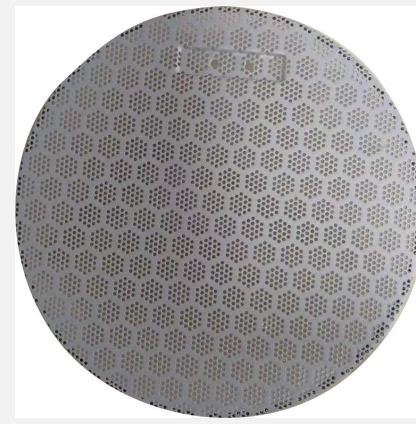


Structural principle design

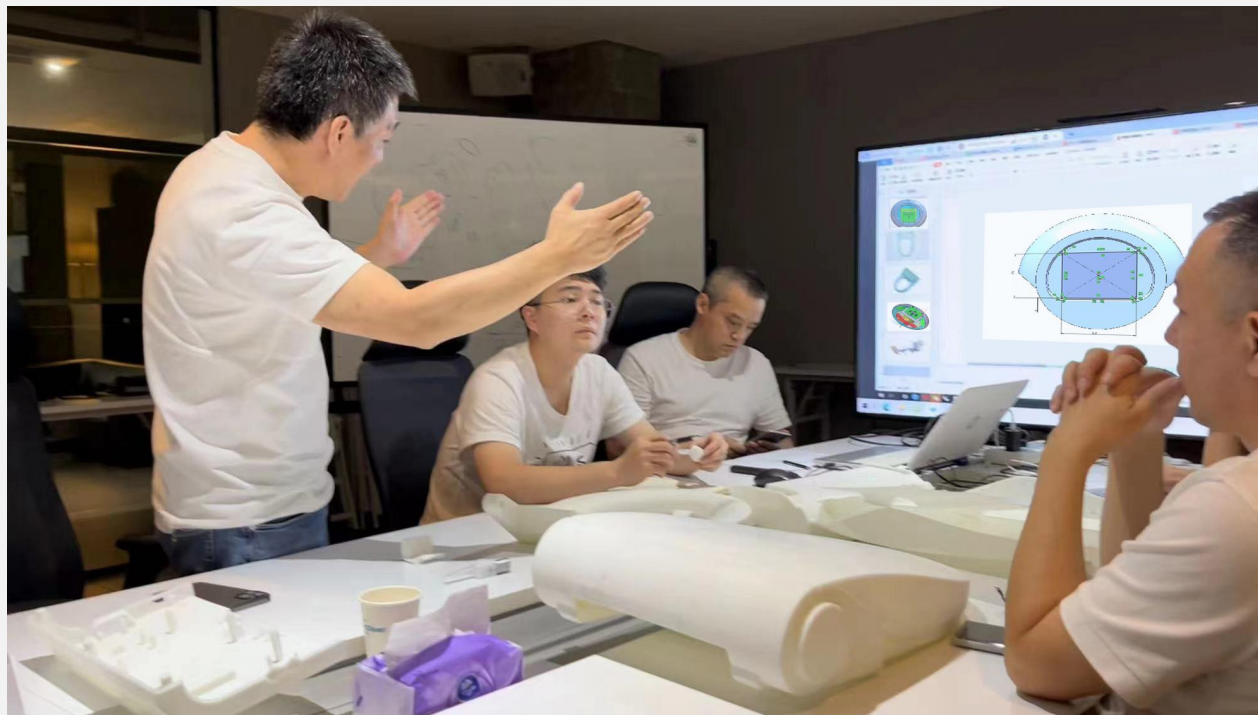


Search for relevant patents of existing competitive products on the market, avoid patents and design new appearance and structure.

Selection of relevant components



Structural review



萌宠总装结构需要更新内容

1.氛围灯罩加厚加粉不透光，均匀散光不刺眼



2.小喇叭过线孔至少要改到 5mm*8mm



3.LED 点阵屏从膜膜上固定孔做过线孔，内部加卡线柱，到蓝牙功放板



4.氛围灯的过线孔改到蓝牙功放板的附近



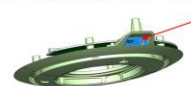
5.蓝牙板的 Type-C 接口固定面降低，适配平齐



6.蓝牙功放 PCB 与立柱相交的两个避让孔要从 7.5mm 加大至 10mm



7.DC 输入改为 5.0，其接口处的高度增加约 5mm，宽度增加 10mm



序号	问题点_20220824
1	弧形外壳与主体的螺丝孔无密封。
2	扬声器位置结构： 1. 外壳厚度化，打胶水或外溢胶； 2. 内圈小，与扬声器孔位干涉。
3	传感器位置结构： 1. 壳定位，直螺孔不对齐； 2. 螺孔位置与喇叭孔位置不接触； 3. 固定螺孔长了，力度不够； 4. 螺孔无密封； 5. 此类螺孔金属变形，不易密封； 6. 螺孔小了，需要螺帽填充； 7. 出螺孔如何密封？
4	低感喇叭位置结构： 1. 螺孔头小了； 2. 螺孔小了，需要螺帽填充； 3. 此类螺孔金属变形，不易密封。
5	LED 屏文是否容易脱落？
6	LED 屏出线方式？
7	两翼的出管孔方式是否影响音质，声学工程师是否评估了？
8	两翼的四个螺孔位，螺孔锥度不够，会变形，锁不紧。
9	温度传感器就壳定位？盖于如何密封？检查螺孔是否干涉？盖于取消效果设计。
10	蓝牙板的插接件盖子口如何密封？
11	大壳位与灯罩干涉。
12	灯罩效果方式不明显，且与灯罩插点是否干涉，胶泥不到位。
13	管座盖盖的止口和螺孔位如何密封？
14	顶盖与腔体的固定扣位如何密封？
15	所有很细很薄的地方是否考虑了会不会产生噪音？
16	大壳位与灯罩干涉。
17	蓝牙板与通讯板的过线孔小了。
18	按键板螺孔时，盖子会被顶破，建议加扣位强度。
19	与腔体腔体的所有过线孔、扣位和螺孔，如何密封？

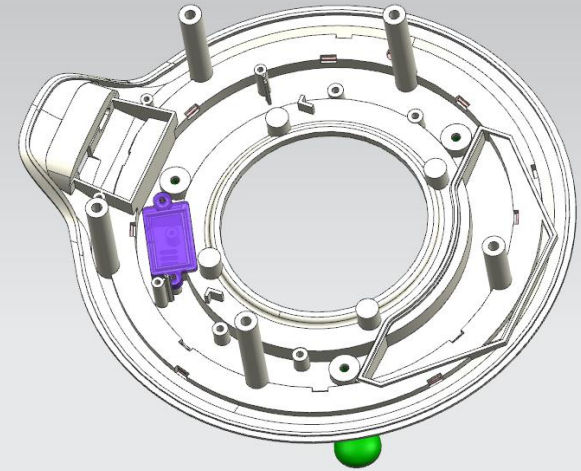
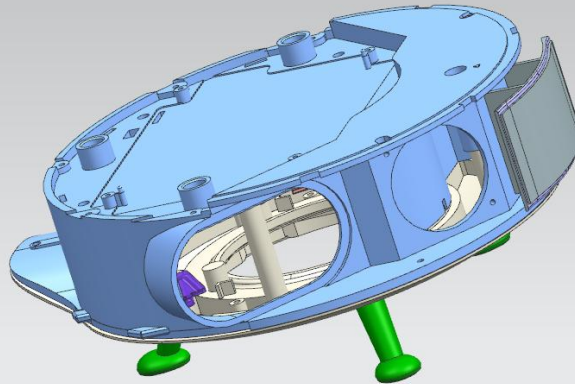
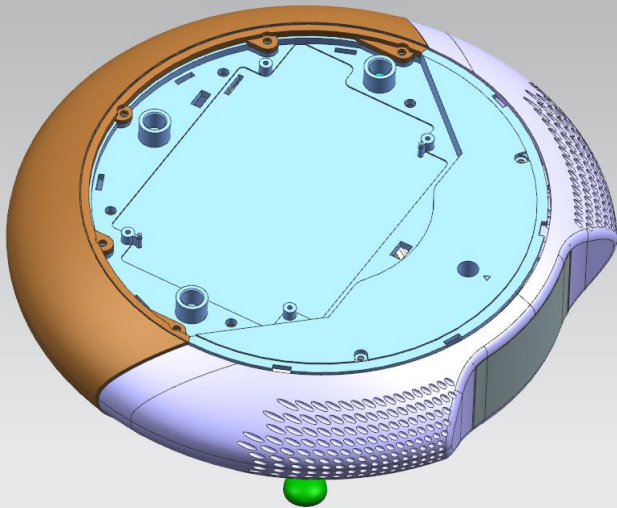
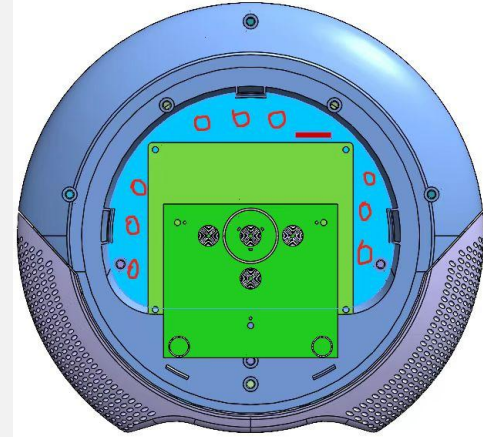
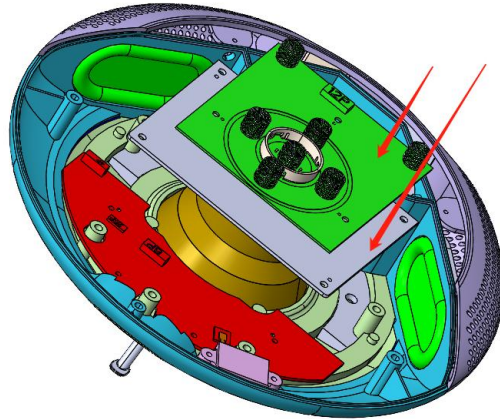
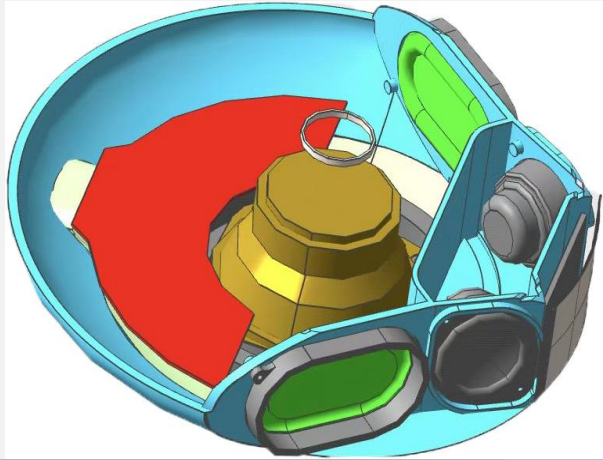
The customer and relevant department personnel review the structure, jointly point out the problem points of the existing structure, and put forward relevant suggestions and opinions. It provides direction for the optimization of subsequent structures.

BOM export

大联高 BOM清单											非开模件	名称	规格	数量	工艺说明	备注			
项目编号	功能分区	零件号	图片	材质/规格	加工工艺	表面处理	颜色	数量	工艺说明	备注									
1	开模件	支架		ABS	注塑	真空镀	PANTONE 7546 C	3	参照图号 (参见外观/结构工艺表)	一个M3螺柱	音控部分	蓝牙	ATS2853	1					
2		支架座		TPE	注塑	吸面	黑色	3	厚度65A (参见外观/结构工艺表)			功放	AD83586B	1					
3		顶盖		ABS透光素材	注塑	细砂吹塑面	PANTONE P1-1UP	1	(参见外观/结构工艺表)			中高音喇叭	40mm	2					
4		喇叭网罩A		ABS素材	注塑	吸面	PANTONE 420U	1				低音喇叭	78mm	1					
5		底座		ABS透光素材	注塑	细砂吹塑面	PANTONE 429U	1	参照图号 (参见外观/结构工艺表)	内部5个M4螺柱 外部4个M3螺柱		振膜	7040	2					
6		主音柱体		ABS素材	注塑	吸面	PANTONE P1-1UP	1	参照图号 (参见外观/结构工艺表)	内部4个M4螺柱		内存	1G	1					
7		点阵屏底座块		ABS素材	注塑	吸面	PANTONE P1-1UP	1				PCB主控板		1				几米	
8		母地柱		光扩散PC半圆	注塑	半透明吸面	乳白色	1		同一模具		LED点阵屏	YXF122401P2 小白助理	1				带背胶	
9		灯罩		光扩散PC半圆	注塑	不透明吸面	乳白色	1			LED氛围灯	橙色12颗方形灯珠	1				铝合金底板	3合一(LED灯4颗*3)	
10		感应转盘		ABS素材	注塑	吸面	PANTONE P1-1UP	1			配件	音控绒布	1				粘接在喇叭网罩A上	专业布艺	
12		弧形外壳		ABS素材	注塑	吸面	PANTONE 420U	1	特选壳盖厚度10(壁厚) (参见外观/结构工艺表)		整机配件	电源适配器	1			12V3A 两片插脚、3.5*1.35*10mm直流接口 线长1.5米 中规3C标准		外观简约	单独选购
14		按键块C		硬胶板 T=3	五金冲压	/	/	4			紧固件	十字半圆头螺丝	M3*6	7		不锈钢304	固定低音喇叭		
15		低音喇叭网罩A		特选半乳白网板 T=0.4	五金冲压	吸面	PANTONE 7547U	1	(网孔的01-2)				M4*10	5			固定底座		
													自攻十字st2*6	1			温度感应器1个		
													自攻十字st2.6*6	14			网罩4个 中高音喇叭4个 蓝牙功放板4个 温度感温2个		
										自攻十字st3.0*6	13		固定主控板4个 按键板3个 弧形 外壳6个						
										自攻十字st3.0*12	4		固定配置块						
										软件及主控板	/			(睡眠监测板+主控板)2个壳体及配件+APP	1套		中档、几米	总装	

Sort out the detailed information of each component, including material, process, processing method, surface treatment, etc., for subsequent proofing.

Structure confirmation

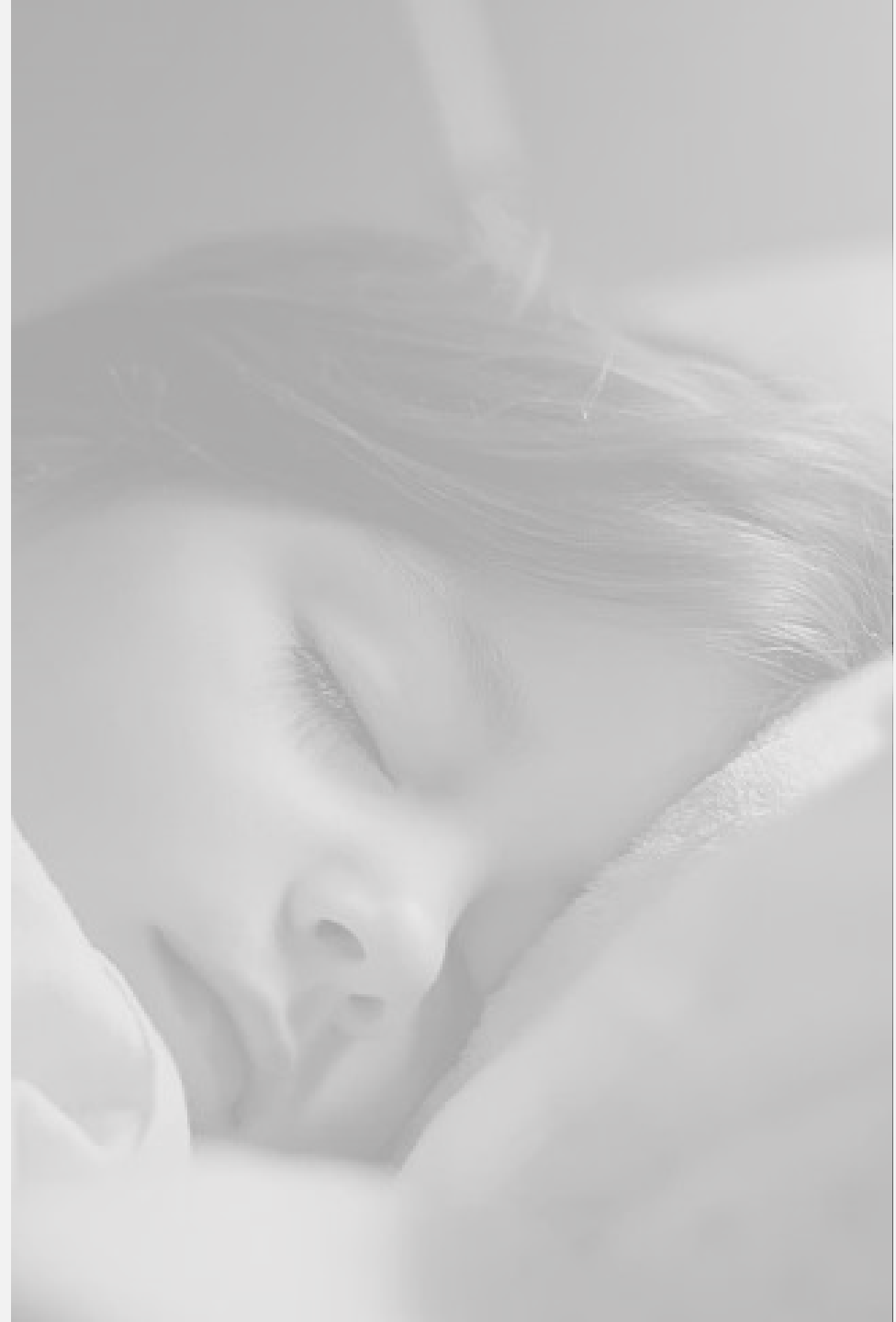


After the appearance, structure, software and hardware are all confirmed, the next proofing work can be carried out.

05

Prototype verification

样机验证



Prototype process description

1.顶盖

颜色：PANTONE P1-1UP
材质：ABS+pc 遮光材料
加工工艺：注塑
表面处理：哑面细晒纹，镭雕参考2D矢量图

2.导光柱

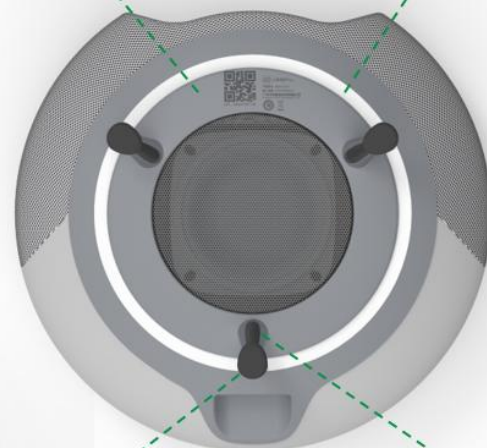
颜色：乳白色半透明
材质：半透 PC
加工工艺：注塑
表面处理：光面

4.底壳

颜色：PANTONE 433u
材质：ABS+pc 遮光材料
加工工艺：注塑
表面处理：哑面晒纹,镭雕参考2D矢量图

5.灯罩

颜色：乳白色半透明
材质：半透 PC
加工工艺：注塑
表面处理：哑面



3.弧形外壳

颜色：PANTONE 420U
材质：ABS
加工工艺：注塑
表面处理：哑面

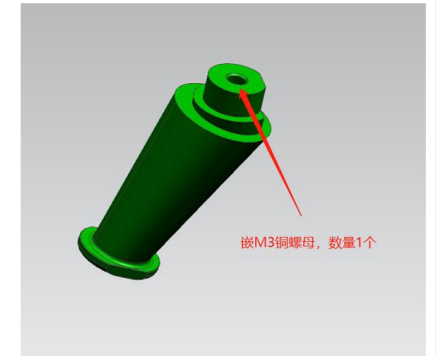
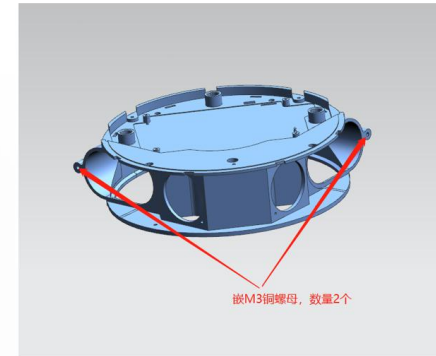
6.支脚垫*3

颜色：黑色
材质：搪胶
加工工艺：复模
表面处理：哑面

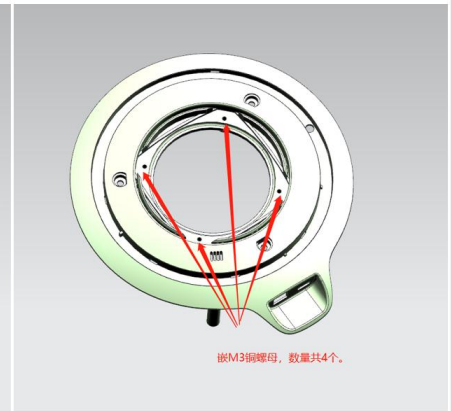
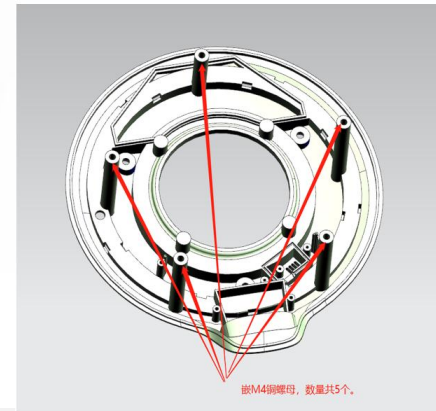
7.支脚

颜色：PANTONE 7546C
材质：ABS
加工工艺：注塑
表面处理：电镀

嵌铜螺母工艺图



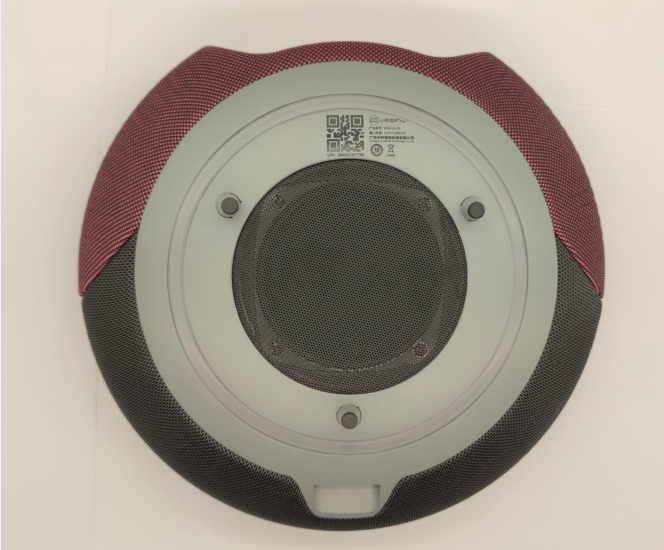
嵌铜螺母工艺图



Prototype production

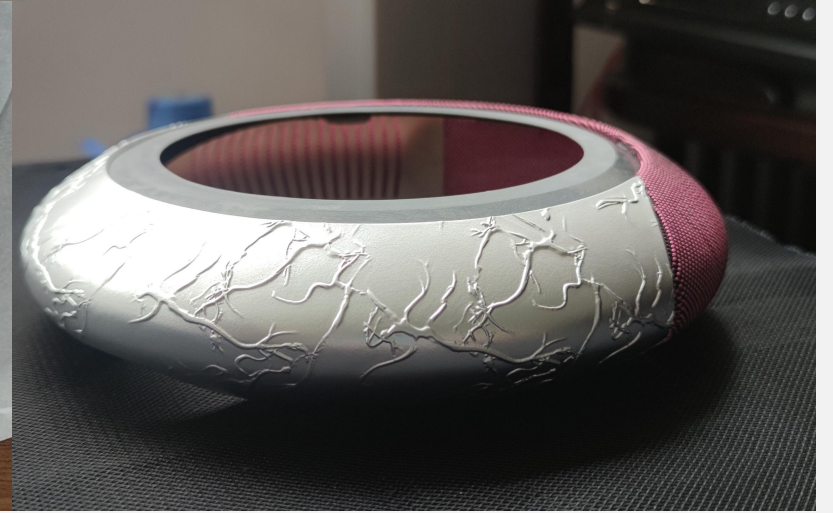


Appearance sample



Provide reference for structural principle design and hardware stacking, and preliminarily confirm product size and functional layout.

Structural samples



Check whether the assembly relationship of each component is reasonable, and also verify the rationality and coordination of hardware function and structure.

Prototype assembly



Engineers and relevant designers install a small batch of prototypes to find the loopholes in the assembly process, and further optimize the appearance and structure design drawings according to the actual situation, so as to ensure the efficient, simple and orderly assembly of the products produced in subsequent batches.

Prototype function test



After the prototype is assembled, the hardware engineer will carry out functional test on the sample to determine whether the prototype meets the design requirements, and optimize and summarize the corresponding parts in time.

Summary of prototype problems

1. 氛围灯罩加厚加粉不透光，均匀散光不刺眼



2. 小喇叭过线孔至少要改到 5mm*8mm



3. LED 点阵屏从振膜原上固定孔做过线孔，内部加卡线柱，到蓝牙功放板



4. 氛围灯的过线孔改到蓝牙功放板的附近



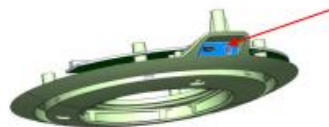
5. 蓝牙版的 Type-C 接口固定面降低，适配平齐



6. 蓝牙功放 PCBA 与立柱相交的两个避让孔要从 7.5mm 加大至 10mm

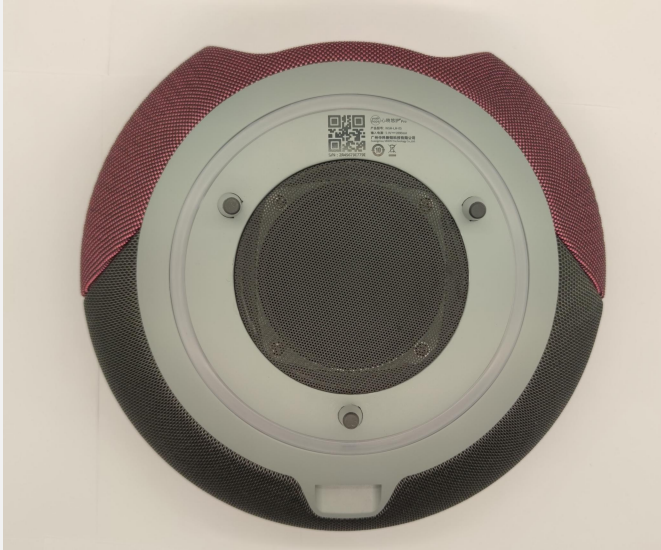


7. DC 输入改为 5.0，其接口处的高度增加约 5mm，宽度增加 10mm



The relevant personnel of each department and the customer will review the prototype, jointly find the problem points and discuss the improvement methods.

Physical drawing of prototype assembly



Check the appearance of the prototype carefully, find the common defects, confirm the relevant process and optimize the design drawings according to the problem points.

Product specification

项目		要求	备注
输出	直流电压	5V	
	额定电流	2A	
	电流范围	0~2A	
	额定功率 (最大)	10W	
	纹波与噪声	≤100mVp-p	
	电压精度	±5%	
输入	电压范围	90~264VAC	
	频率范围	47~63Hz	
	效率	≥80%	
	浪涌电流 (最大)	冷启动: 30A/115VAC, 60A、230VAC	
	漏电流 (最大)	接触电流 < 100 μA/264VAC	
保护	过负载	110~200%额定输出功率 保护模式: 打嗝模式, 负载异常条件移除后可 自动恢复	
	过电压	110~140%额定输出电压	
环境	工作温度	-20~+70℃	
	工作湿度	0~95%RH, 无冷凝	
	储存温度、湿度	-20~+85℃, 0~95%RH, 无冷凝	
	耐振动	10~500Hz, 2G 10分钟/周期, X、Y、Z 轴各 60分钟	
规范	安规&电磁兼容规范	IEC 60601-1, IEC 60601-1-2	
	绝缘等级	初级-次级: 2×MOPP	
	寿命	3年: 100%负载 40℃, 12小时/天	
连接	输入	2Pin CN 插脚	
	输出	USB 输出型	

Prototype function test standard

康凯斯样品承认书、跟踪单

物料名称: 康凯斯 IIC 物料描述: SOT23封装, 40V, 3A

物料编号: MP1584EN-C319 品牌: MPS

供应商: 昂达电子 联系人: 李富民 手机:

送样数量: 20 PCS 送样目的: 物料确认 增加备选供应商 增加备选品牌 送样检验

送样机型: 67060 SPIC 封装: 卷

接收部门: 硬件部 结构部 软件部 品质部

接收人员: 姚能欣 姚能欣 姚能欣

认证内容及结果描述: 姚能欣 姚能欣 姚能欣

认证工程师: 李富民 李富民 李富民

部门负责人签字: 李富民 李富民 李富民

样品测试结果: 合格, 小批量试用 PCS, 使用机型: 67060 适用环境: 车载 合格, 可批量建料 系列确认合格 NG

小批量数量: 送样目的: 物料确认 增加备选供应商 增加备选品牌 送样检验

生产数量: 生产数量: 生产时间: 跟踪人员:

使用情况: 备注:

确认部门: 硬件部 结构部 软件部 品质部

确认工程师: 姚能欣 姚能欣 姚能欣

部门负责人签字: 姚能欣 姚能欣 姚能欣

确认结果: 合格, 可批量建料 系列确认合格 NG, 重新确认 PCS

备注:



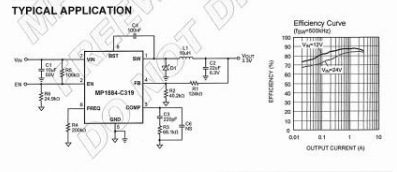
DESCRIPTION
The MP1584-C319 is a high frequency step-down switching regulator with an integrated internal high-side high voltage power MOSFET. It provides 3A output with current mode control for fast loop response and easy compensation.

FEATURES

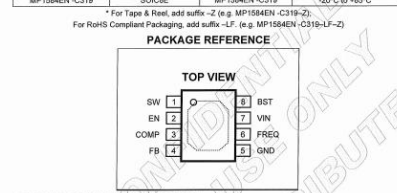
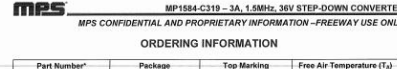
- Wide 4.5V to 36V Operating Input Range
- Programmable Switching Frequency from 100kHz to 1.5MHz
- High-Efficiency Pulse Skipping Mode for Light Load
- Ceramic Capacitor Stable
- Internal Soft-Start
- Internally Set Current Limit without a Current Sensing Resistor
- Available in SOICSE Package.

APPLICATIONS

- High Voltage Power Conversion
- Automotive Systems
- Industrial Power Systems
- Distributed Power Systems
- Battery Powered Systems



MP1584-C319 Rev. 1.0
www.MonolithicPower.com
MPS Proprietary Information. Unauthorised Photocopy and Duplication Prohibited.
© 2011 MPS. All Rights Reserved.



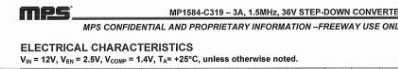
ABSOLUTE MAXIMUM RATINGS

Supply Voltage (V_{IN}) -0.3V to +40V
Switch Voltage (V_{SW}) -0.3V to V_{IN} + 0.3V
BST to SW -0.3V to +6V
All Other Pins -0.3V to +6V
Continuous Power Dissipation (T_a = +25°C) 2.5W
Junction Temperature -55°C to +150°C
Lead Temperature -260°C
Storage Temperature -65°C to +150°C

Recommended Operating Conditions

Supply Voltage V_{IN} 4.5V to 36V
Output Voltage V_{OUT} 0.8V to 25V
Operating Junct. Temp (T_J) -20°C to +125°C

MP1584-C319 Rev. 1.0
www.MonolithicPower.com
MPS Proprietary Information. Unauthorised Photocopy and Duplication Prohibited.
© 2011 MPS. All Rights Reserved.

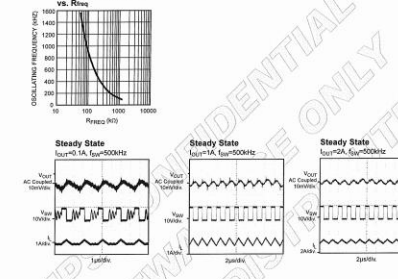
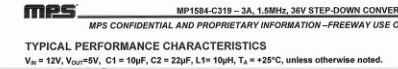


ELECTRICAL CHARACTERISTICS
V_{IN} = 12V, V_{SW} = 2.5V, V_{COMP} = 1.4V, T_a = +25°C, unless otherwise noted.

Parameter	Symbol	Condition	Min	Typ	Max	Units
Feedback Voltage	V _{FB}	4.5V < V _{IN} < 36V	0.776	0.8	0.824	V
Upper Switch On Resistance	R _{DS(on)}	V _{IN} = V _{OUT} = 5V		150		mΩ
Upper Switch Leakage	I _{SW}	V _{IN} = 0V, V _{OUT} = 0V, V _{FB} = 36V		1		μA
Current Limit	I _{LIM}		4.0	4.7		A
COMP to Current Sense Transconductance	g _{CS}			9		AV
Error Amp Voltage Gain ⁽¹⁾	A _v			200		WV
Error Amp Transconductance	g _{EA}	I _{load} = 53μA		40	60	80 μAV
Error Amp Min Source current	I _{ES}	V _{FB} = 0.7V		5		μA
Error Amp Min Sink current	I _{ES}	V _{FB} = 0.9V		-5		μA
V _{IN} UVLO Threshold	V _{UVLO}		2.7	3.0	3.3	V
V _{IN} UVLO Hysteresis	H _{UVLO}			0.35		V
Soft-Start Time ⁽²⁾	t _{SS}	0V < V _{FB} < 0.8V		1.5		ms
Oscillator Frequency	f _{OSC}	R _{FB2} = 100kΩ		900		kHz
Shutdown Supply Current	I _{SC}	V _{IN} = 0V		-1.2	20	μA
Quiescent Supply Current	I _Q	No load, V _{FB} = 0.9V		100	125	μA
Thermal Shutdown	T _{SD}			150		°C
Thermal Shutdown Hysteresis	H _{SD}			15		°C
Minimum ON Time ⁽³⁾	t _{ON}			100		ns
Minimum On Time ⁽⁴⁾	t _{ON}			100		ns
EN Up Threshold	V _{EN}		1.35	1.5	1.65	V
EN Hysteresis	H _{EN}			300		mV



MP1584-C319 Rev. 1.0
www.MonolithicPower.com
MPS Proprietary Information. Unauthorised Photocopy and Duplication Prohibited.
© 2011 MPS. All Rights Reserved.



MP1584-C319 Rev. 1.0
www.MonolithicPower.com
MPS Proprietary Information. Unauthorised Photocopy and Duplication Prohibited.
© 2011 MPS. All Rights Reserved.

The equipment conforms to the specifications for safe use of Japanese tramcar products, including communication function test, weight test, power test, beam lighting test, anti-drop test, waterproof grade test, fire grade test, etc.

Material test report

MPS MP1584-C319 - 3A, 1.5MHz, 36V STEP-DOWN CONVERTER
MPS CONFIDENTIAL AND PROPRIETARY INFORMATION - FREEMAN USE ONLY

High Frequency Operation
The switching frequency of MP1584-C319 can be programmed up to 1.5MHz with an external resistor.

With higher switching frequencies, the inductive reactance (X_L) of capacitor comes to dominate, so that the ESL of input/output capacitor determines the input/output ripple voltage at higher switching frequency. As a result of that, high frequency ceramic capacitor is strongly recommended as input decoupling capacitor and output filtering capacitor for such high frequency operation.

Layout becomes more important when the device switches at higher frequency. It is essential to place the input decoupling capacitor, catch diode and the MP1584-C319 (VIN pin, SW pin and PGN2) as close as possible, with traces that are very short and fairly wide. This can help to greatly reduce the voltage spike on SW node, and lower the EMI noise level as well.

Try to run the feedback trace as far from the inductor and noisy power traces as possible. It is often a good idea to run the feedback trace on the side of the PCB opposite of the inductor with a ground plane separating the two. The compensation components should be placed close to the MP1584-C319. Do not place the compensation components close to or under high dv/dt SW node, or inside the high dv/dt power loop. If you have to do so, the proper ground plane must be in place to isolate those. Switching loss is expected to be increased at high switching frequency. To help to improve the thermal conduction, a grid of thermal vias can be created right under the exposed pad. It is recommended that they be small (15mil barrel diameter) so that the hole is essentially filled up during the plating process, thus aiding conduction to the other side. Too large a hole can cause 'solder wicking' problems during the reflow soldering process. The pitch (distance between the centers) of several such thermal vias in an area is typically 40mil.

External Bootstrap Diode
It is recommended that an external bootstrap diode be added when the input voltage is no greater than 5V or the 5V rail is available in the system. This helps improve the efficiency of the regulator. The bootstrap diode can be a low cost one such as IN4148 or BAT54.



Figure 2 - External Bootstrap Diode
This diode is also recommended for high duty cycle operation (when V_{OUT}/V_{IN} > 85%) or low V_{IN} (< 5VIN) applications.

At no load or light load, the converter may operate in pulse skipping mode in order to maintain the output voltage in regulation. Thus there is less time to refresh the BS voltage. In order to have enough gate voltage under such operating conditions, the difference of V_{IN} - V_{OUT} should be greater than 3V. For example, if the V_{OUT} is set to 3.3V, the V_{IN} needs to be higher than 3.3V+3V=6.3V to maintain enough BS voltage at no load or light load. To meet this requirement, EN pin can be used to program the input UVLO voltage to V_{OUT}+3V.

MPS MP1584-C319 - 3A, 1.5MHz, 36V STEP-DOWN CONVERTER
MPS CONFIDENTIAL AND PROPRIETARY INFORMATION - FREEMAN USE ONLY

TYPICAL APPLICATION CIRCUITS

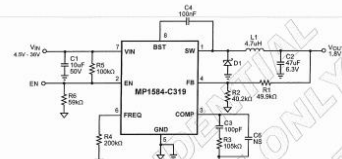


Figure 3 - 1.5V Output Typical Application Schematic

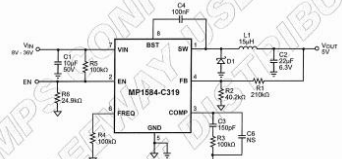


Figure 4 - 5V Output Typical Application Schematic

MPS MP1584-C319 - 3A, 1.5MHz, 36V STEP-DOWN CONVERTER
MPS CONFIDENTIAL AND PROPRIETARY INFORMATION - FREEMAN USE ONLY

PCB LAYOUT GUIDE

PCB layout is very important to achieve stable operation. It is highly recommended to duplicate EVB layout for optimum performance.

If change is necessary, please follow these guidelines and take Figure 5 for reference.

- 1) Keep the path of switching current short and minimize the loop area formed by input cap, high-side MOSFET and external switching diode.
- 2) Bypass ceramic capacitors are suggested to be put close to the V_{IN} Pin.
- 3) Ensure all feedback connections are short and direct. Place the feedback resistors and compensation components as close to the chip as possible.
- 4) Route SW away from sensitive analog areas such as FB.
- 5) Connect IN, SW, and especially GND respectively to a large copper area to cool the chip to improve thermal performance and long-term reliability.

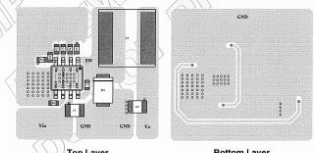
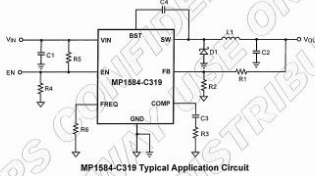
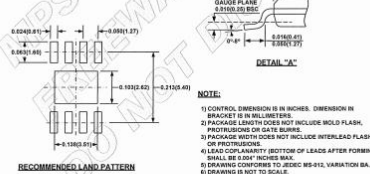
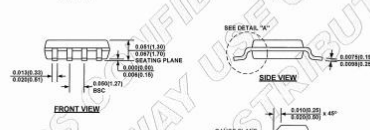
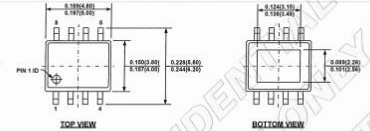


Figure 5 - MP1584-C319 Typical Application Circuit and PCB Layout Guide

MPS MP1584-C319 - 3A, 1.5MHz, 36V STEP-DOWN CONVERTER
MPS CONFIDENTIAL AND PROPRIETARY INFORMATION - FREEMAN USE ONLY

PACKAGE INFORMATION

SOIC6 (EXPOSED PAD)



NOTE:
1) CONTROL DIMENSION IS IN INCHES. DIMENSION IN BRACKET IS IN MILLIMETERS.
2) PACKAGE LENGTH DOES NOT INCLUDE MOLD FLASH, PROTRUSION OR GATE BURR.
3) PACKAGE WIDTH DOES NOT INCLUDE INTERLEAD FLASH OR PROTRUSION.
4) DIMENSIONS OF LEADS AFTER FORMING.
5) SMALLER DIMENSIONS APPLY TO 0508 AND 0818 VARIANTS.
6) DRAWING IS NOT TO SCALE.

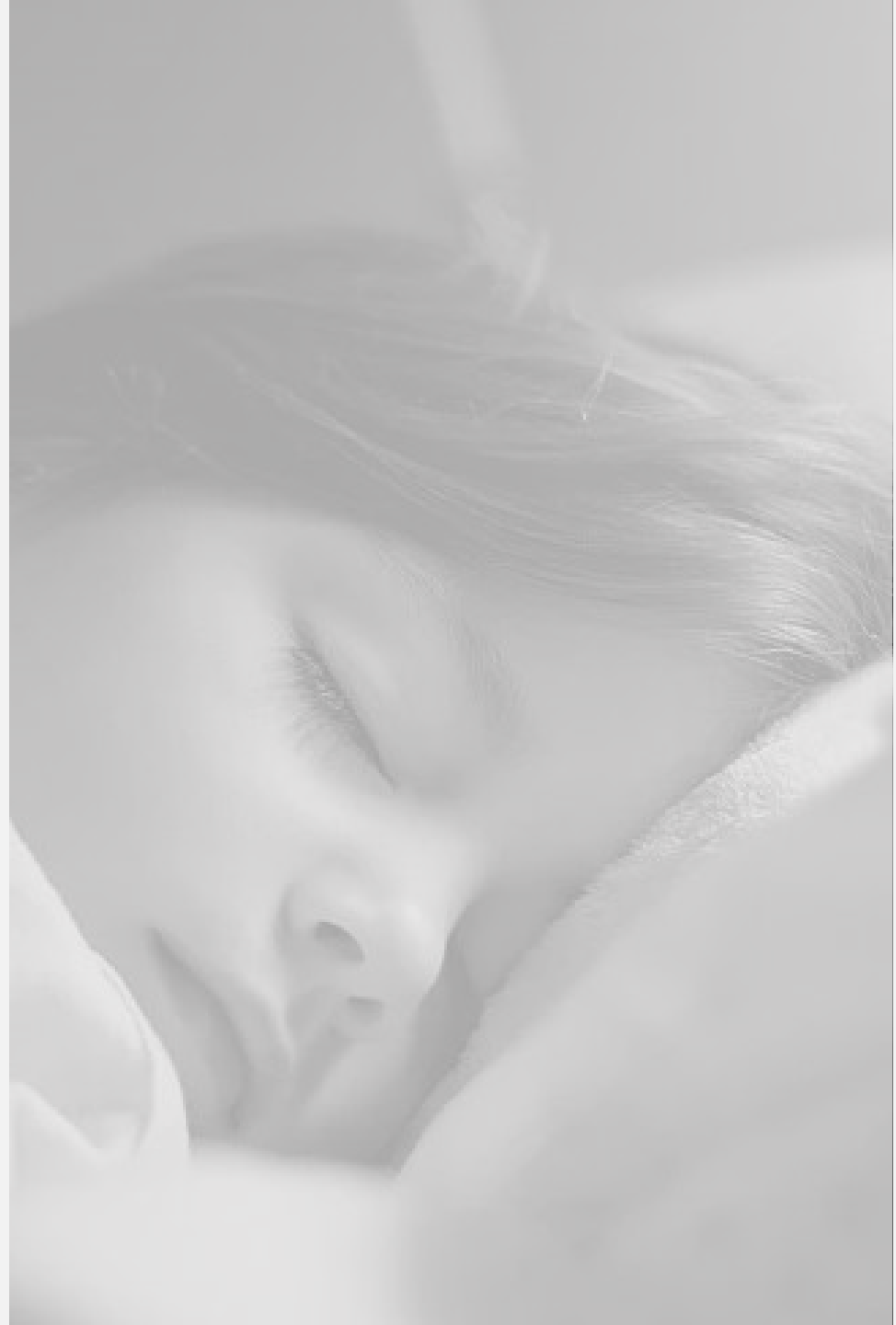
康凯斯样品承认书、跟踪单

物料名称	MP1584-C319	物料描述	3A, 1.5MHz, 36V STEP-DOWN CONVERTER
物料规格	MP1584-C319	品牌	MPS
物料数量	20 PCS	送测目的	新产品确认
送测机型	6760	物料部	李磊
接收部门	硬件部	结构部	软件部
接收人员	李磊	结构部	李磊
认证内容及结果概述	性能良好	软件部	李磊
认证工程师	李磊	物料部	李磊
部门负责人签字	李磊	物料部	李磊
样品确认结果	合格, 可能量测	系列确认合格	合格
小批量数量	送测目的	新产品确认	合格
生产数量	生产数量	生产时间	跟踪人员
使用状况	备注	确认部门	硬件部
备注	确认部门	结构部	软件部
确认内容及结果概述	确认工程师	物料部	李磊
确认结果	合格, 可能量测	系列确认合格	合格
备注	确认部门	结构部	软件部

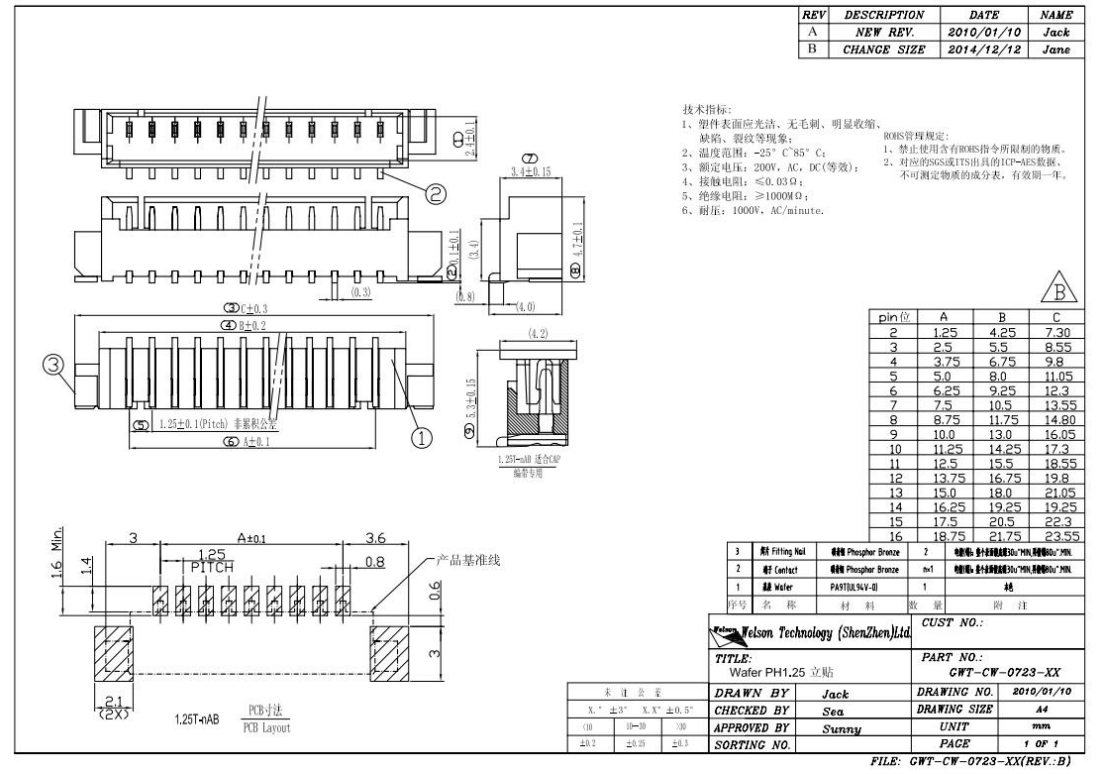
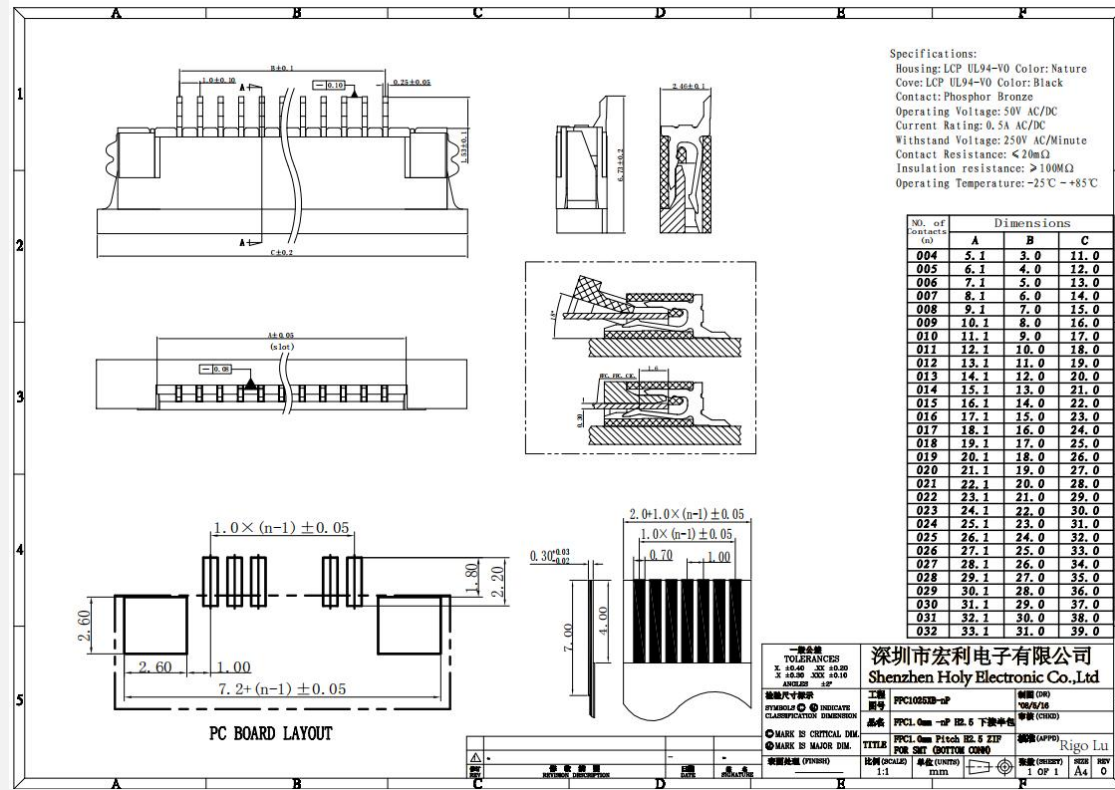
06

Small-scale trial production

小 批 量 试 产

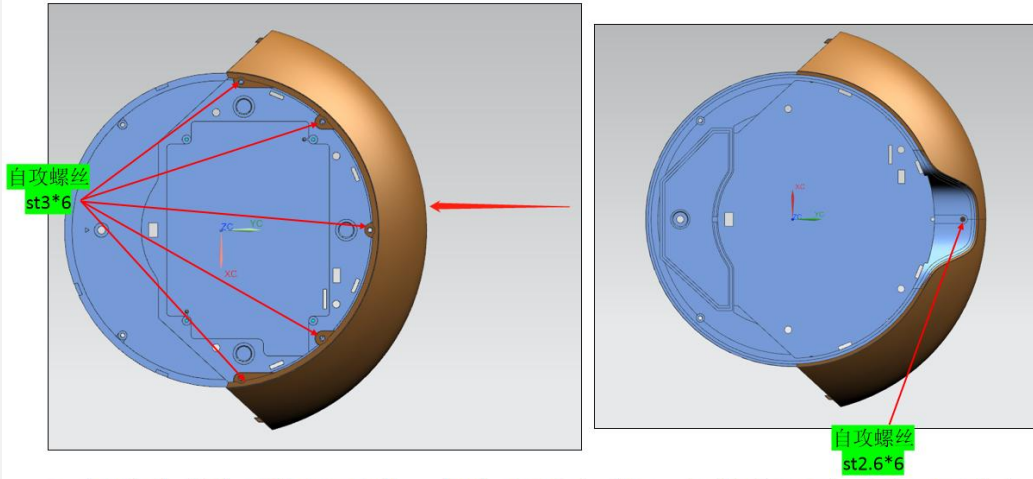


Technical requirement

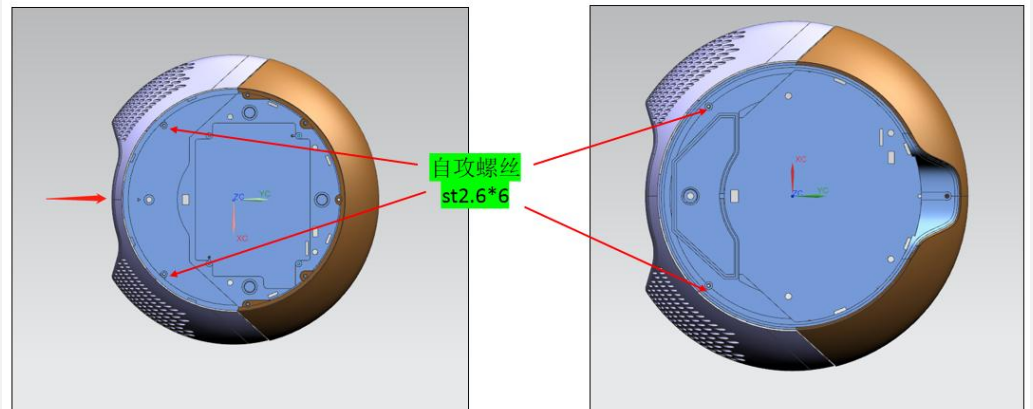


Details

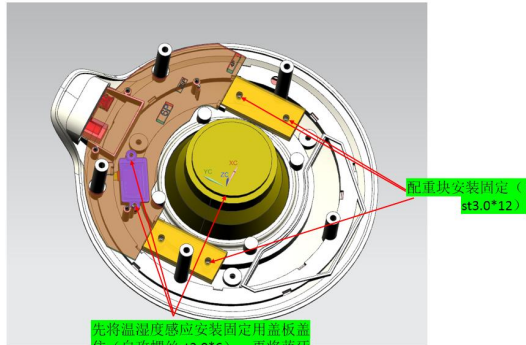
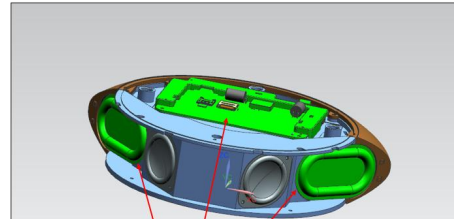
主音腔壳体与弧形外壳先安装并用自攻螺丝固定



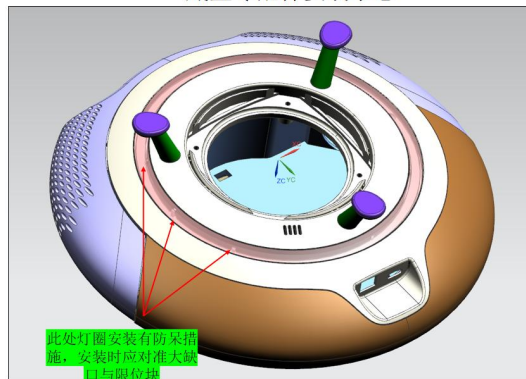
主音腔壳体与喇叭网罩（点阵屏固定块）安装并用自攻螺丝固定



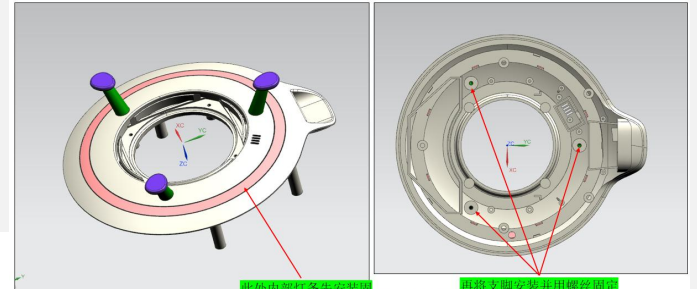
音腔主壳体电子元器件部分安装



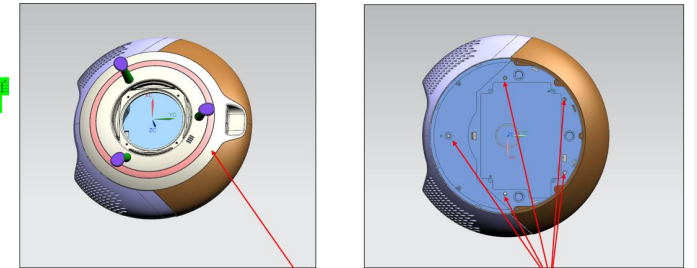
底盖零配件安装示意



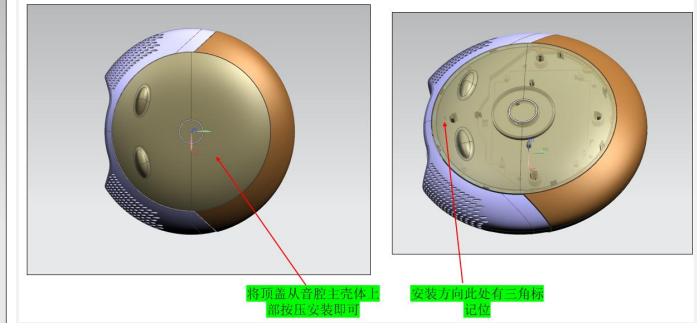
底盖零配件安装示意



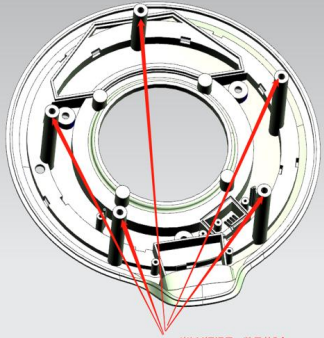
底盖与音腔主壳体安装示意



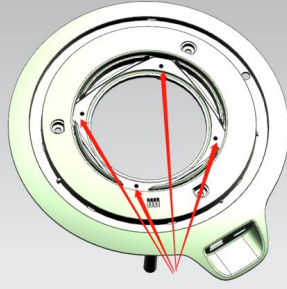
顶盖与音腔主壳体安装示意



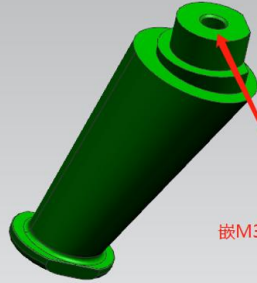
Mold information



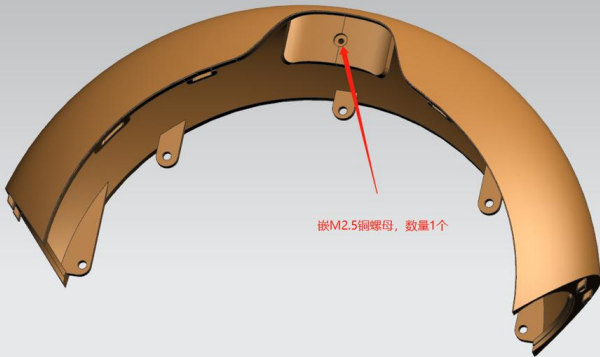
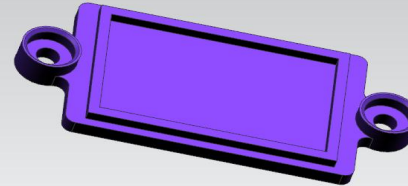
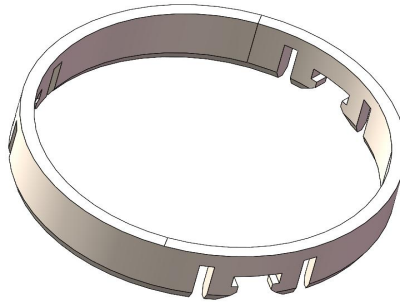
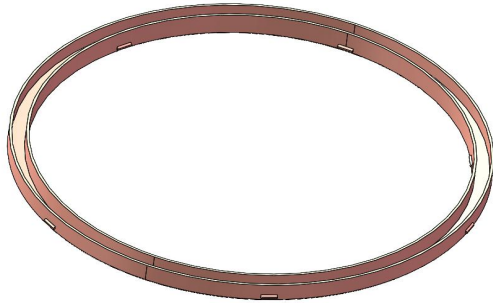
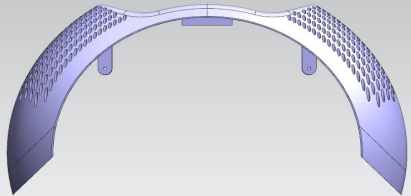
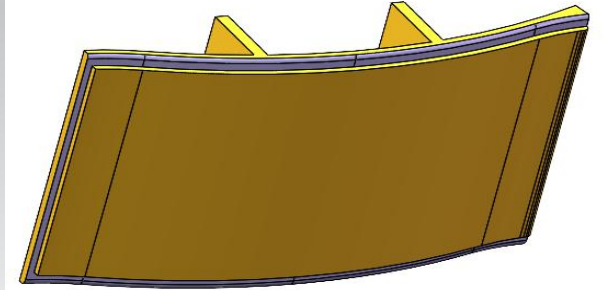
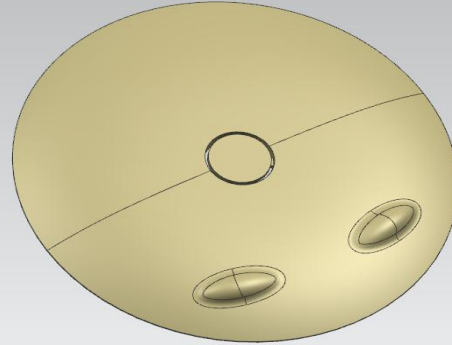
嵌M4铜螺母, 数量共5个.



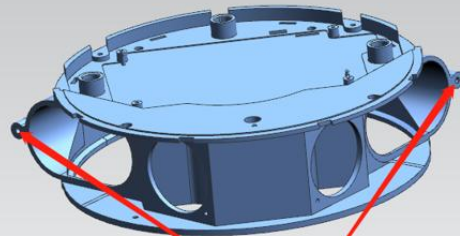
嵌M3铜螺母, 数量共4个.



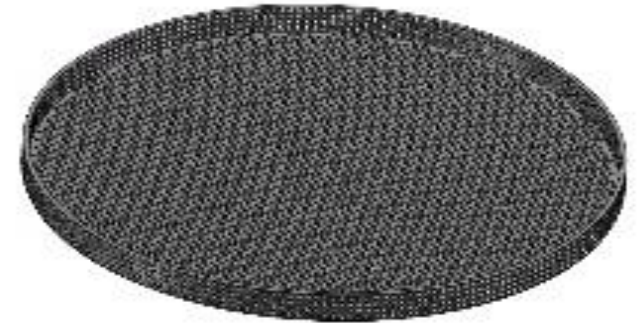
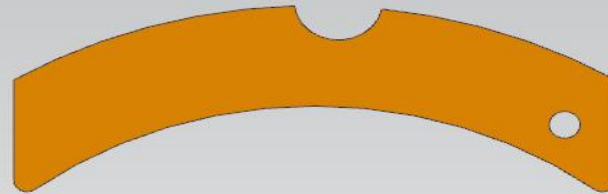
嵌M3铜螺母, 数量1个



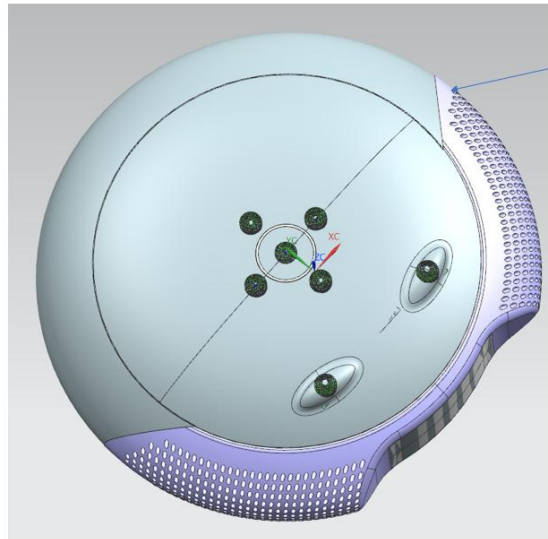
嵌M2.5铜螺母, 数量1个



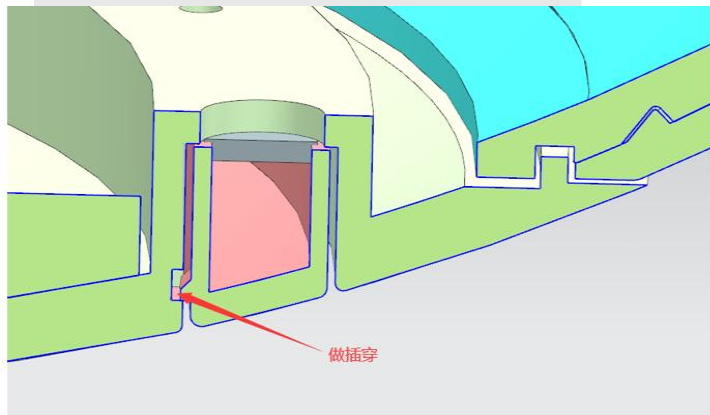
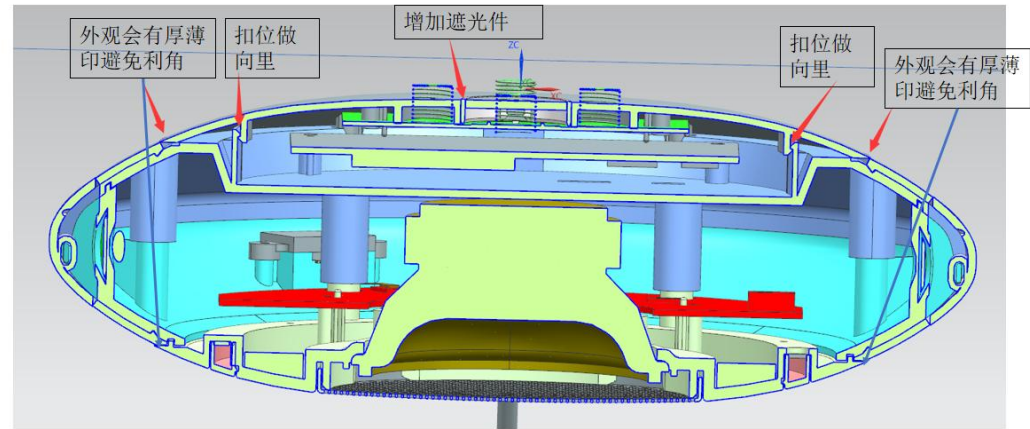
嵌M3铜螺母, 数量2个



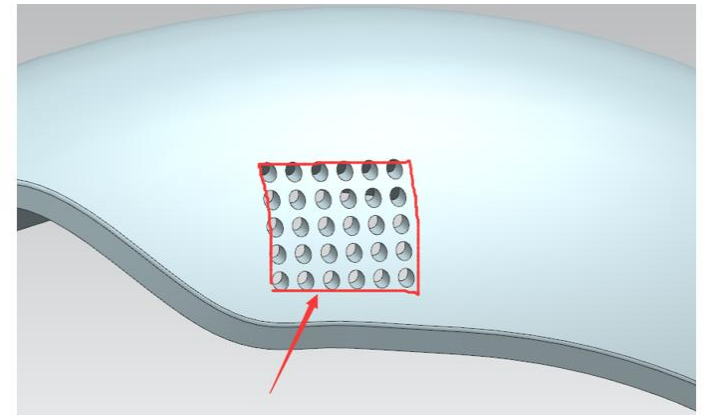
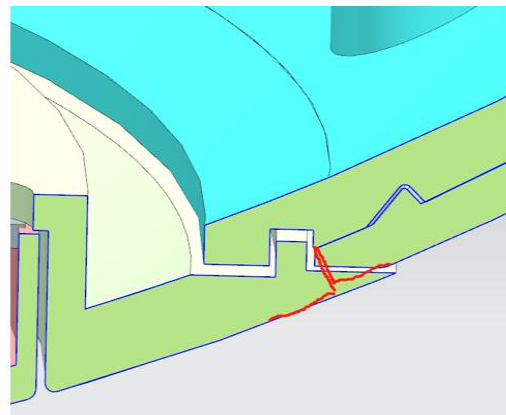
Mold evaluation report



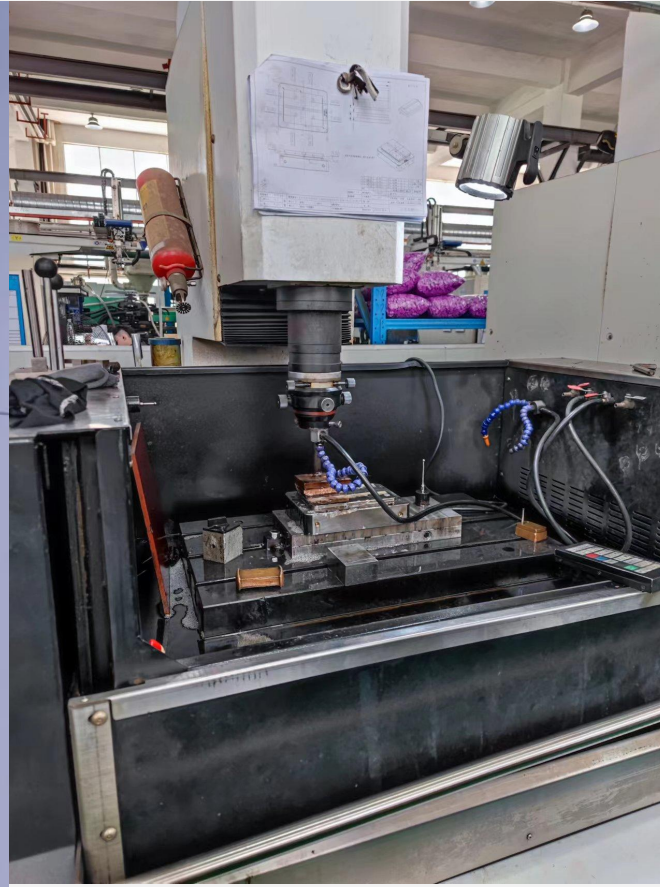
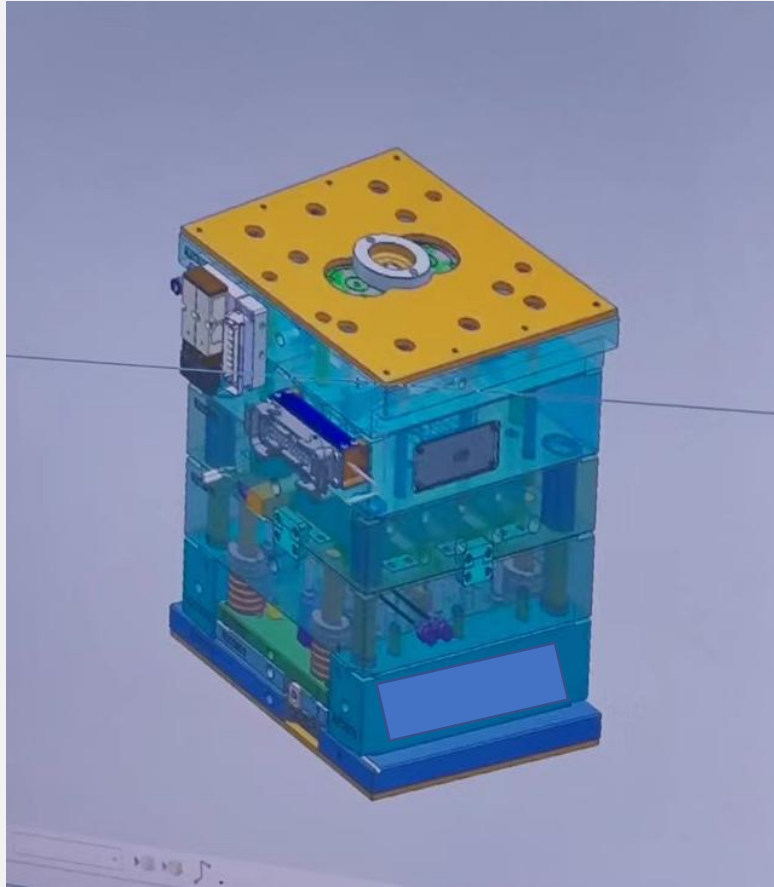
包布的厚度0.6，要预留位置



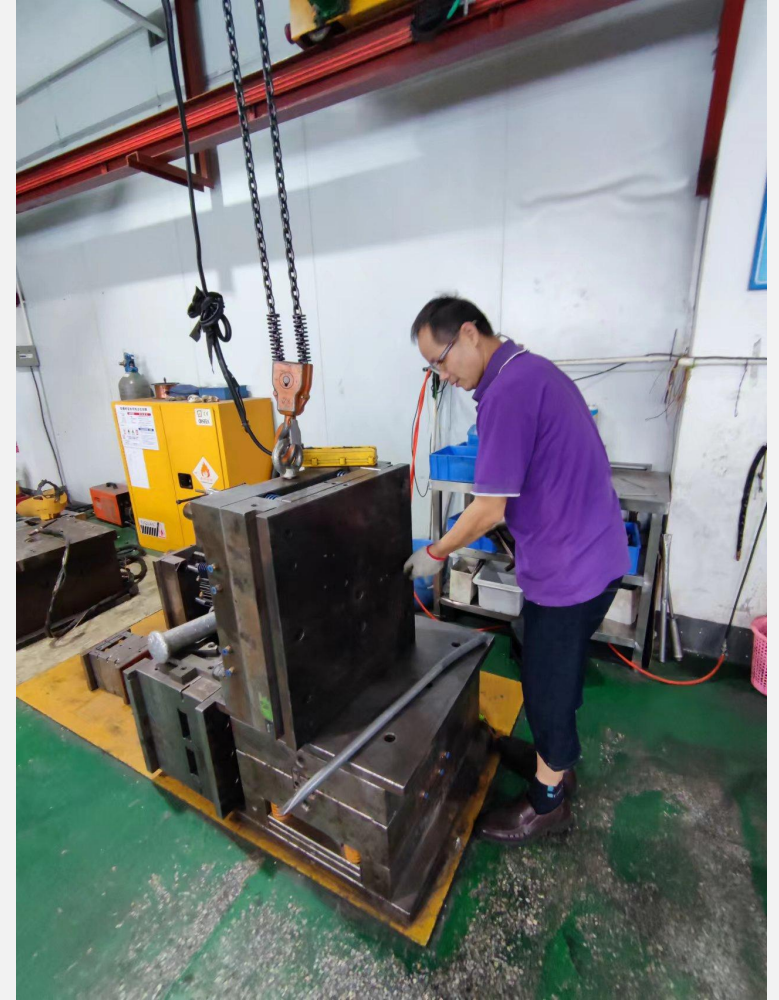
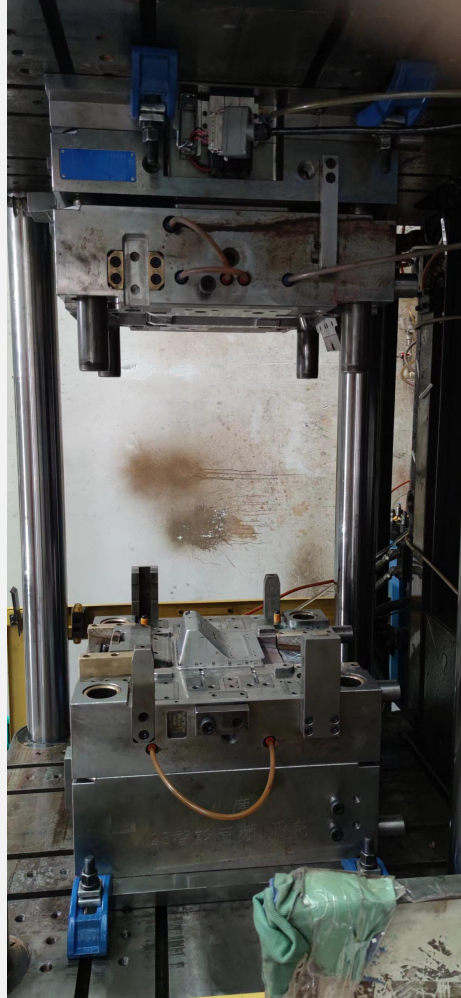
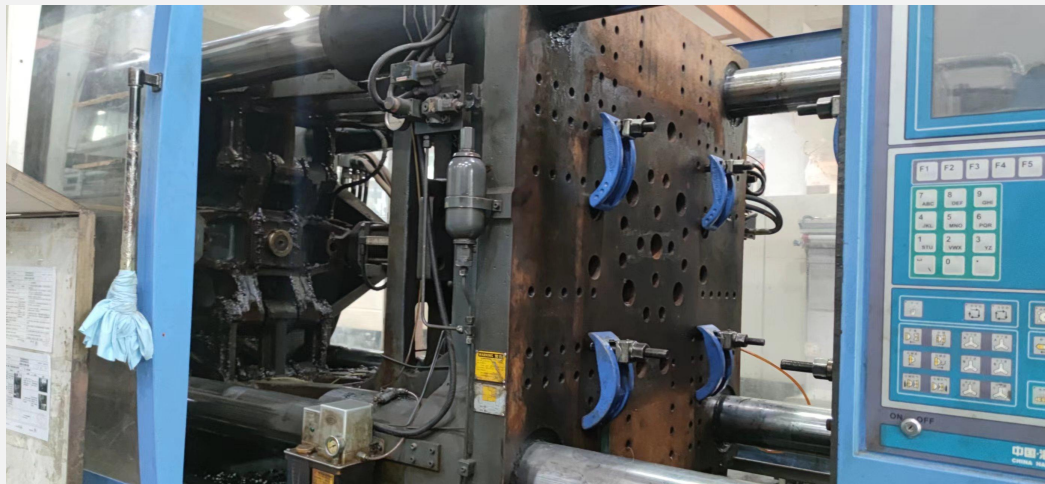
做插穿



Mould design



Mold assembly



Core Team

核心团队



**Excellent top design and
research team**



**Technical
team**

Blue Whale
Industrial Design Co.,
Ltd



**Operation
team**

MASS Co., Ltd

About the team 团队介绍



ZiTian Wang

1986-1990 High School Attached to Guangzhou Academy of Fine Arts (four years)

1990-1994 Industrial Design, Design Department, Guangzhou Academy of Fine Arts (four years)

1994-1995 Designer director of Industrial Design Company of Vanke Industrial Company

1995-1996 Design Director of Naida Furniture (Shenzhen) Co., Ltd

1996 - present General Manager of Shenzhen Blue Whale Industrial Design Co., Ltd

About the team 团队介绍



LuXun Wang

Deputy General Manager of Shenzhen Blue Whale Industrial Design Co., Ltd

From the laboratory of the Department of Electronic Engineering, Tsinghua University. He has participated in national 863 project, CPU soft core and other projects.

He has been engaged in product design and mass production for many years. He has rich experience in wearable devices, data acquisition, data communication, video communication, life products, medical devices, etc. It has obtained many national invention patents.

About the team 团队介绍



Hui Wu

Hardware technology director, 18 years of experience in intelligent hardware industry.

New retail, PLC automation, consumer electronics, Internet of Vehicles, intelligent medical care, intelligent classification equipment, intelligent transportation, intelligent home, intelligent hardware of Internet of Things communication.

Complete 1000 industrial applications such as intelligent rice cooker, intelligent garbage sorting hardware, 4G thermostatic instrument, vehicle-mounted GPS equipment, intelligent central control of electric vehicle, intelligent hardware of electric cabinet, BMW intelligent cabinet, police detector, intelligent street lamp, millet intelligent furniture, 3C consumer electronics, etc.



HuaQin Zhang

Software technology director, 19 years of software technology experience.

Internet of Things, artificial intelligence, big data analysis, proficient in system architecture design, system analysis, software implementation, performance optimization, system security, etc., familiar with Windows, Linux, Unix and other mainstream operating systems, MySQL, SQL Server and other database development and Java, JavaScript, php, C++ and other languages, proficient in massive data analysis.

Complete new retail, sharing economy, big data application fields, and software applications in smart cities, medical care, education, transportation, agriculture, smart home and other industries.

About the team 团队介绍



Fei Wang

Senior designer, 21 years of experience in structural design

Participated in projects such as Wanjiale Water Heater and Jiuyang Juicer in the blue whale industrial design

He is good at structural design of kitchen appliances, household cleaning, consumer electronics and equipment.

We have completed the product development and structural design of a number of optical fiber fusion splicers, intelligent interactive trash cans, X-ray machines, water quality detectors, and heat sensors in steel plants.



AnDing Zhong

Senior designer. 18 years of experience in structural design

Participated in projects such as TCL switch and Lake vacuum cleaner in Blue Whale industrial design

He is good at kitchen and household products, electronic products and equipment, and has completed the product development and structural design of multiple optical fiber fusion splicers, communication instruments and meters, multiple military personnel, communication equipment, and life detectors.

About the team 团队介绍



Ming Lan

Design Director, 30 years of experience in design and project management

In Blue Whale, I participated in the projects of Lake vacuum cleaner, Jiuyang juicer and Huowang range hood.

More than 15 years of experience in plastic toys, electronic product structure design (including various complex surface modeling), mold manufacturing

Check. Good at structural design of household appliances, robots, smart home, consumer electronics and equipment.

Be familiar with plastic and hardware molds and their surface processing, and understand all processes and processes of product design and development, prototype production, mold production, and mass production



JingXin Lei

Graduated from Beijing University of Technology with a bachelor's degree in mechanical and electrical engineering. Focus on automation equipment and tooling design.

In Blue Whale, I participated in projects such as Midea Air Conditioner, Gree Air Conditioner and Huowang Range Hood.

10 years of experience in conductor manufacturing equipment assembly and design

2 years of experience in process and design of lithium battery equipment

2 years of experience in designing abrasive tools, abrasives and electroplating production lines

Seven years of experience in designing medical devices and accessories tooling



Mei Jie

Product structure design, more than 10 years of plastic mold and product structure design and project engineering experience.

Participated in projects such as Midea induction cooker and Wanjiale water heater in Blue Whale industrial design.

Good at smart home, toys, 3C products, not limited to categories.

Familiar with plastic mold and product surface processing, product development and production process! Participated in PMP project management training.

About the team 团队介绍



YiFeng Liao

Graduated from the Department of Art Design with a bachelor's degree in product design, and has been engaged in industrial design for 4 years.

Participated in projects such as Wanjiale water heater and Lake vacuum cleaner in blue whale industrial design

Good at industrial design of consumer electronics, equipment and smart home products

Be able to accurately interpret user needs, carry out product design and research, and grasp popular trends and design directions. With solid art skills, excellent color sense, strong three-dimensional space imagination and creativity.



XiaoYun Zheng

Graduation of industrial design

Participated in TCL switch project in blue whale industrial design

Good at consumer electronics, women's care products, smart home products.

Be able to understand and interpret users' needs from the perspective of users. Be able to carry out creative design according to user needs and explore the shape and color, form and appearance of products from a professional perspective, and conduct research and development based on aesthetics and practicality.



WenLin He

Graduated from the Department of Art Design with a bachelor's degree in product design, and has been engaged in industrial design industry for 5 years.

Participated in projects such as TCL switch and Gree air conditioner in Blue Whale industrial design

He is good at the appearance design of products in the fields of medical and health care, beauty, smart home appliances, consumer electronics, and equipment. He has solid product performance skills and excellent product aesthetic ability. He has done more than 70 projects in total, and 11 products are known to be listed.



THANKS

Body data collection, analysis and design process

December 2021 to September 2022