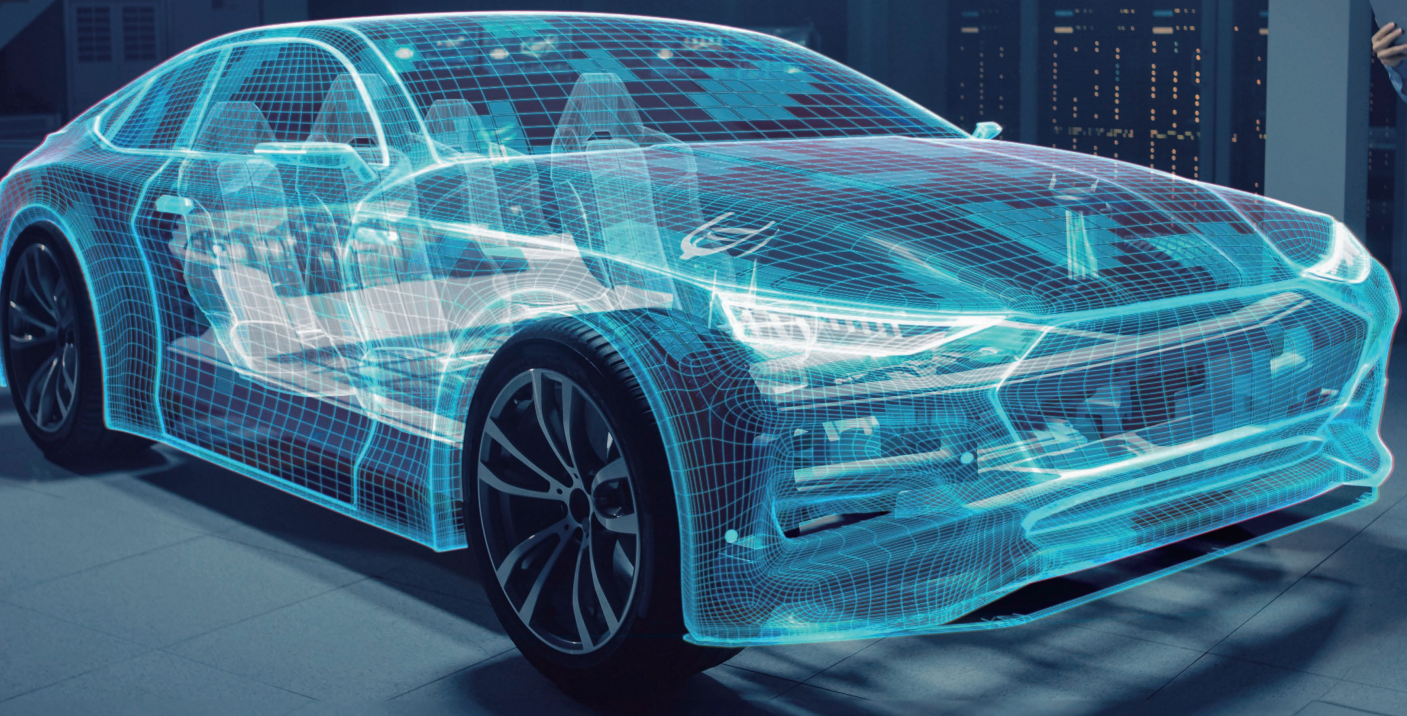


Automotive Electronics Intelligent Controller Solution Service Provider

汽车电子智能控制器方案服务商



Shenzhen H&T Intelligent Control Co., Ltd.
深圳和而泰智能控制股份有限公司

Stock Code SZ.002402 股票代码 002402



With over 20 years of industry experience, we have built robust competitive advantages.
二十余年行业积累, 构筑强竞争壁垒

96 亿元
Revenue: 1.34 billion
US dollars
公司营收

20+ 年
Industry Experience:
20+years
行业经验

22+ 个
Global Layout:
22+ locations
全球布局

200+ 个
Honorary Awards: 200+
荣誉奖项

2000+ 项
Core Patents: 2000+
核心专利

About H&T

H&T-A global leader in intelligent control solutions.

Shenzhen H&T Intelligent Control Co., Ltd., one of the world's leading intelligent control manufacturers, was established in 2000. Backed up by technical resources from top universities and a strong financial support, the company has been cultivating in the intelligent control industry for more than 20 years.

H&T has always been tech-innovation oriented. Our core R&D team has over 15 years of development experience and has applied for more than 2,000 core patents. Adhering to the concept of "global operation, global delivery, and global service," the company set over 20 centers worldwide to provide customers with efficient and professional intelligent control solutions across 40+ countries.

Over the past 20 years, H&T has always upheld its enterprise spirit of "Sharp and Agile, Committed and Serious". In the future, we will keep this belief, working seriously and committedly with our customers, providing exceptional service, and strive to become a cornerstone enterprise that empowers our customers to achieve greater success.

关于和而泰

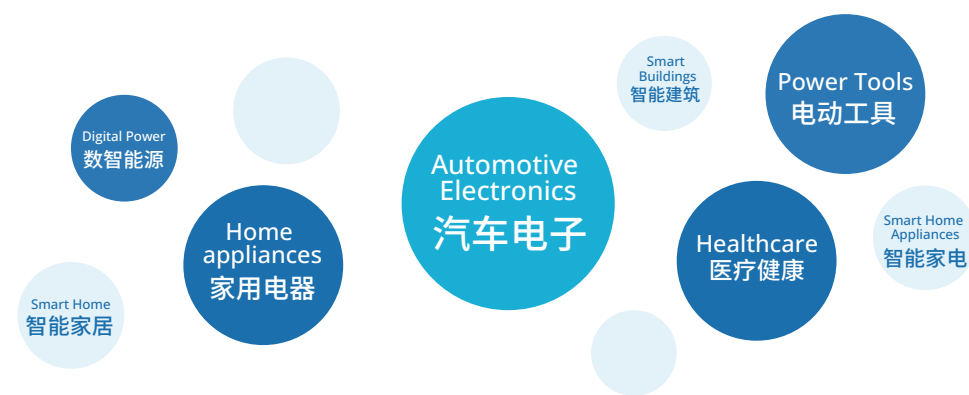
和而泰是全球领先的智控方案提供商

深圳和而泰智能控制股份有限公司成立于2000年, 是全球领先的智能控制器制造商之一。公司依托顶级高校的技术资源和股东背景, 专注于智能控制器行业已有二十余年。

和而泰始终以技术创新为核心, 核心研发团队拥有超过十五年的研发经验, 累计申请核心专利2000多项。公司在全球40多个国家和地区设有超过22个客户服务中心, 秉承“全球运营, 全球交付, 全球服务”的理念, 致力于为全球客户提供高效、专业的智能控制解决方案。

二十余载专注务实的征程, 和而泰始终秉承“敏锐敏捷, 认同认真”的企业精神。未来, 我们将继续加大自主技术创新力度, 致力于成为数智时代的基石企业, 助力客户取得更大成功。

Focused Industry and Strategy Market
集团业务布局



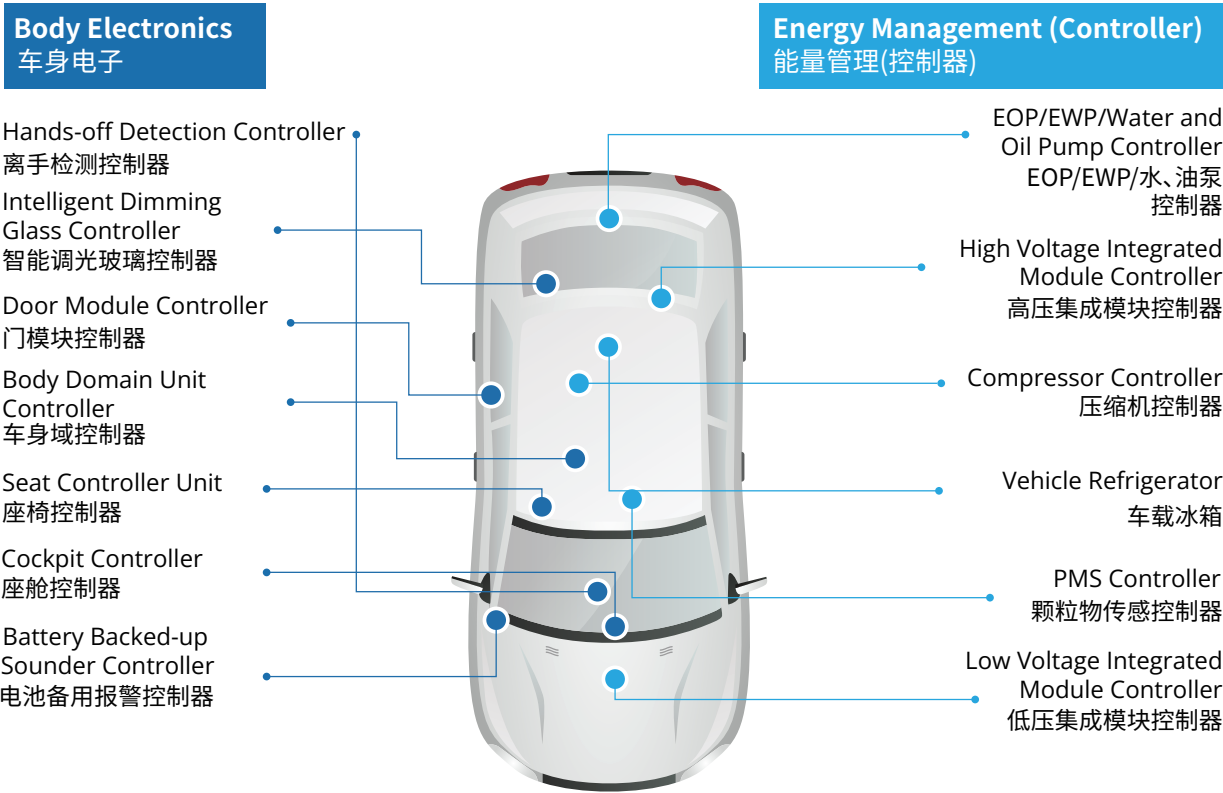
H&T Automotive Overview
汽车电子业务板块概览

Team Members 员工 300+ The R&D team makes up approximately 40% of our workforce 全体员工300多人, 研发占比40%	Annual Sales (2024) 2024年营收 110,000,000 110 Million US dollars CAGR 144.74% 复合增长率 144.74%	Annual PCBA Output 年PCBA产量 11,200,000 11.2 million pieces annually, ensuring product quality through high standards and strict requirements 年产PCBA 1120万
Global Partnerships 主要合作伙伴 12+ Established partnerships with OVER 12 renowned global leading brands 与超过12家知名全球品牌达成合作	Manufacturing Facilities 生产基地 4 4 locations: Shenzhen, Hangzhou, Romania, and Vietnam 深圳、杭州、罗马尼亚、越南	Business Models 业务模式 3 Equipped with JDM, ODM, and OEM collaboration capabilities 三种模式: JDM、ODM、OEM

Core Advantages
核心优势

- Forward-looking R&D
前瞻研发
- Advanced Manufacturing
先进制造
- Global footprint
全球布局

Main Products of Automotive Electronics
汽车电子主要产品



General Technology
通用技术

- Hardware EMC and simulation
· 硬件EMC及仿真
- Software platformization
· 软件平台化
- Structural simulation
· 结构仿真
- Network security and functional safety
· 网络安全及功能安全
- Software full stack testing
· 软件全栈测试

Core Technology of Products
产品核心技术

- **HOD (Hands-off Detection Controller)**
—— touch algorithm, time-sharing multiplexing
· **离手检测控制器**
—— 触摸算法, 分时复用
- **Intelligent Dimming Glass Controller**
—— multi-drive independent control
· **智能调光玻璃控制器**
—— 多驱独立控制
- **Body Domain Unit Controller**
—— ripple anti-pinch algorithm
· **车身域控制器**
—— 纹波防夹算法
- **Compressor Controller**
—— self-developed FOC control algorithm
· **压缩机控制器**
—— 自研FOC控制算法
- **Integrated Module Controller**
—— 3* BLDC simultaneous control algorithm
· **集成模块控制器**
—— 3* BLDC同时控制算法

Forward-looking R&D

前瞻研发

A professional R&D team with rich experience in the automotive industry and a customer-centric R&D layout

具有丰富汽车行业经验的专业研发团队及客户近地化研发布局

The total number of R&D team members is over 120, distributed in four major regions including Shenzhen, Shanghai, Wuhan and Europe. More than 65% of the R&D team members have over 10 years of industry experience, and 20% of the members are product and basic technology experts.

研发团队总人数120+, 分布在深圳、上海、武汉及欧洲等4大地区

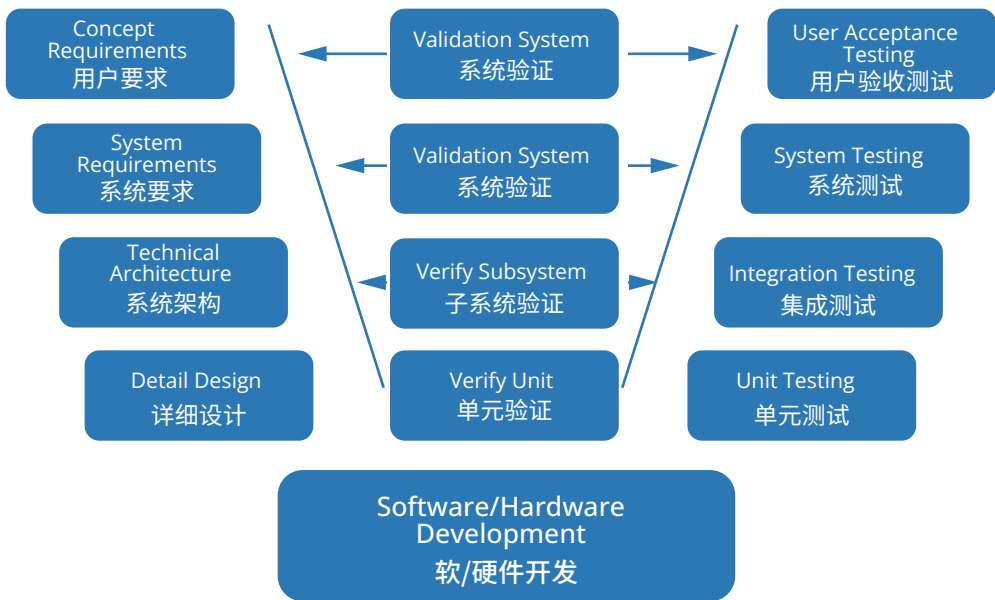
研发团队**65%以上**成员拥有**超过10年**行业经验, **20%**成员为产品及基础**技术专家**



Forward-looking R&D

前瞻研发

R&D Development System
获得专业认证的开发体系



Certification
证书

- ASPICE CL2
- ISO 26262 ASIL D
- ASPICE CL3
- ISO 21434

VectorDevice
Vector设备

- VN1640A
- VH6501
- DIVA

Intrepid Device
Interpid设备

- NEO FIRE
- NEO RED
- Vehicle Spy

Altium Designer	PROTEUS	Matlab

Advanced Manufacturing

先进制造能力

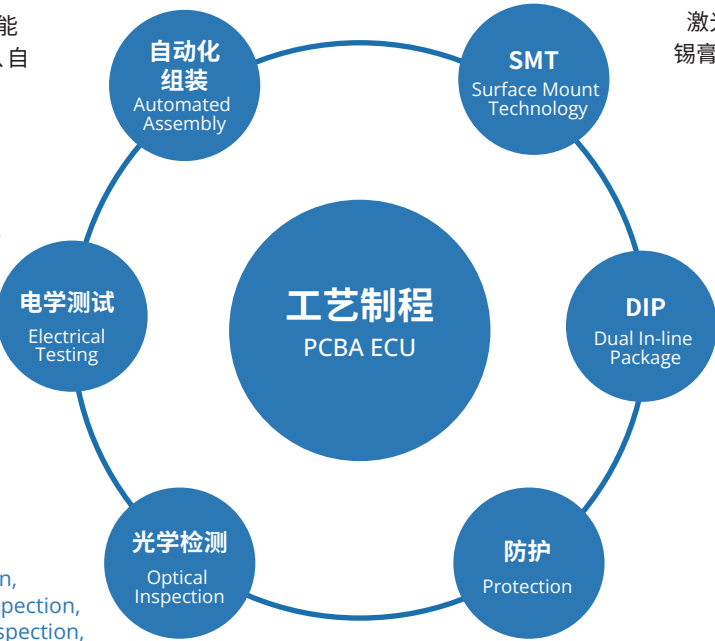
One-stop professional process solution
一站式专业制程解决方案

Robotic Assembly, Crimping Pins, Intelligent Screw Locking, Laser Welding, Riveting, Automatic Packaging, Low Pressure Molding

机械手组装、压接插针、智能螺丝锁附、激光焊接、铆接、自动包装、低压注塑

In-Circuit Test, Flying Probe Test, High-Pot Test, Functional Test, End-of-Line Test, Aging Test, Air Tightness Test
ICT、飞针测试、高压测试、功能测试、EOL 测试、老化测试、气密性测试

3D Solder Paste Inspection, 3D Automated Optical Inspection, Laser Inspection, X-ray Inspection, Microscopic Inspection, Adhesive Film Inspection, Automated X-ray Inspection (Computed Tomography)
3D SPI、3D AOI、激光检测、X-ray、显微检测、胶膜检测、AXI (CT)



Laser Engraving, PCB Cleaning, Glue Dispensing, Solder Paste Printing, Surface Mount Technology (SMT), Vacuum Nitrogen Reflow, Pre-programming

激光镭雕、PCB清洁、红胶固定、锡膏印刷、表面贴装、真空氮气回流焊接、预烧录

Robotic Soldering, Automatic Odd-Form Component Insertion, Selective Soldering, Laser Welding, Stress-Free Clamping, Milling Depaneling, Pre-forming, Liquid Cleaning

机器人焊接、全自动异形插件、选择性波峰焊接、激光焊接、夹具无应力
Milling分板、预成型、水洗

Plasma, Conformal Coating, UV & IR Curing, Underfill, Vacuum De-bubbling, Dispensing, Potting

等离子处理、三防涂敷、UV&IR固化、底部填充邦定、真空除泡、点胶、灌封

Advanced Manufacturing

先进制造能力

Industry - leading infrastructure and industrial automation
行业领先的基础设施和工业自动化能力



ISO 8 Clean Room
ISO 8 清洁房



11.2 million pcs / 2024 year
1120 万片 / 2024 年



0 Defect Concept
0 缺陷理念



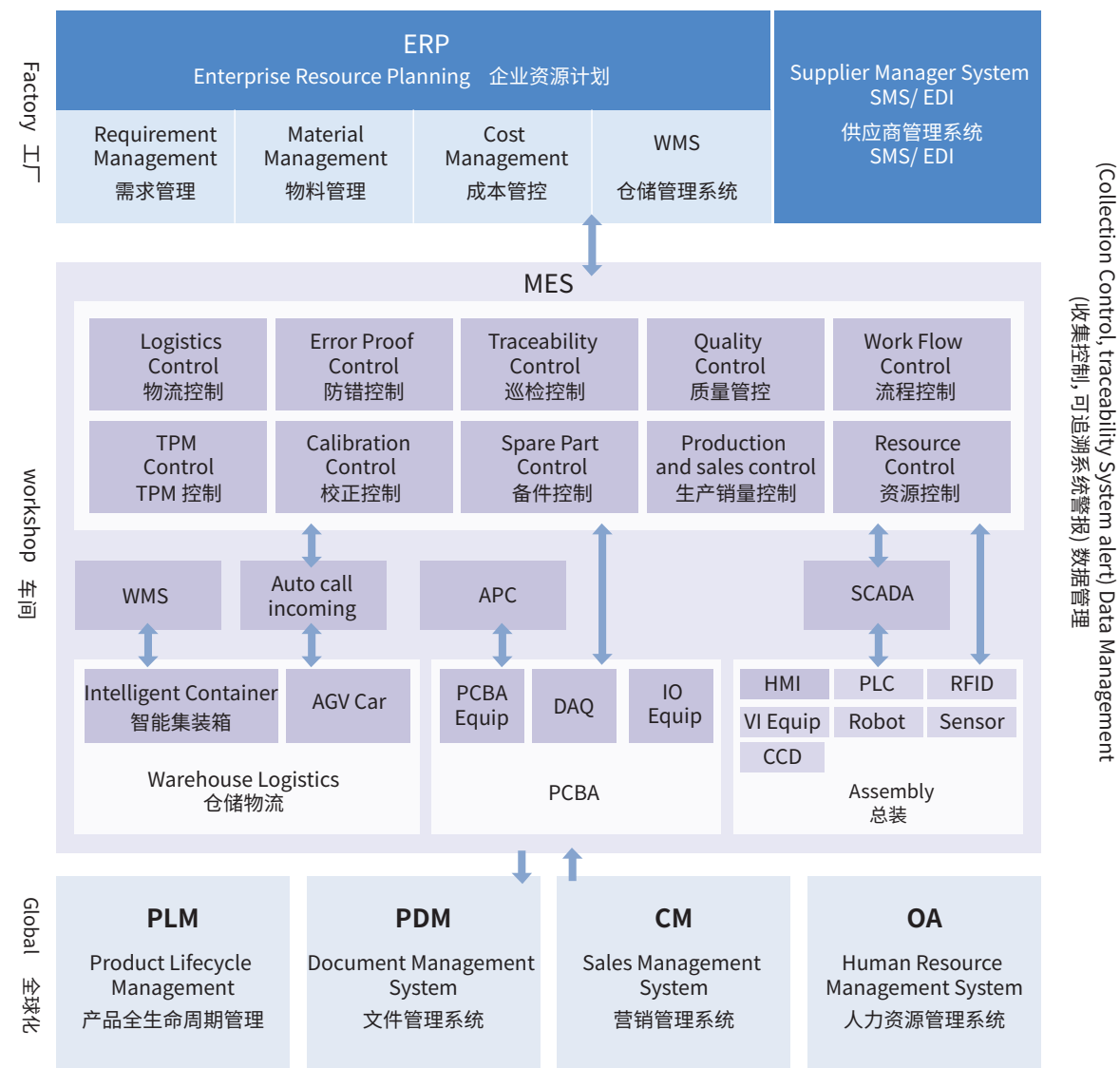
100% Automation
100% 自动化

- PCB assembly & electronic control unit manufacturing process
- ESD protection & humidity sensitive system
- Effectively control the production environment in the workshop (temperature & humidity, VDA19, etc.)
- PCB组装& 电子控制单元制造工艺
- ESD 防护& 湿敏系统
- 有效控制车间生产环境(温度 & 湿度, VDA19 等)

- Independently developed and comprehensive testing system
- High end equipment, focusing on automated production
- Poka Yoke standard
- 自主研发 & 完善测试体系
- 高端设备, 聚焦自动化生产
- Poka-Yoke标准

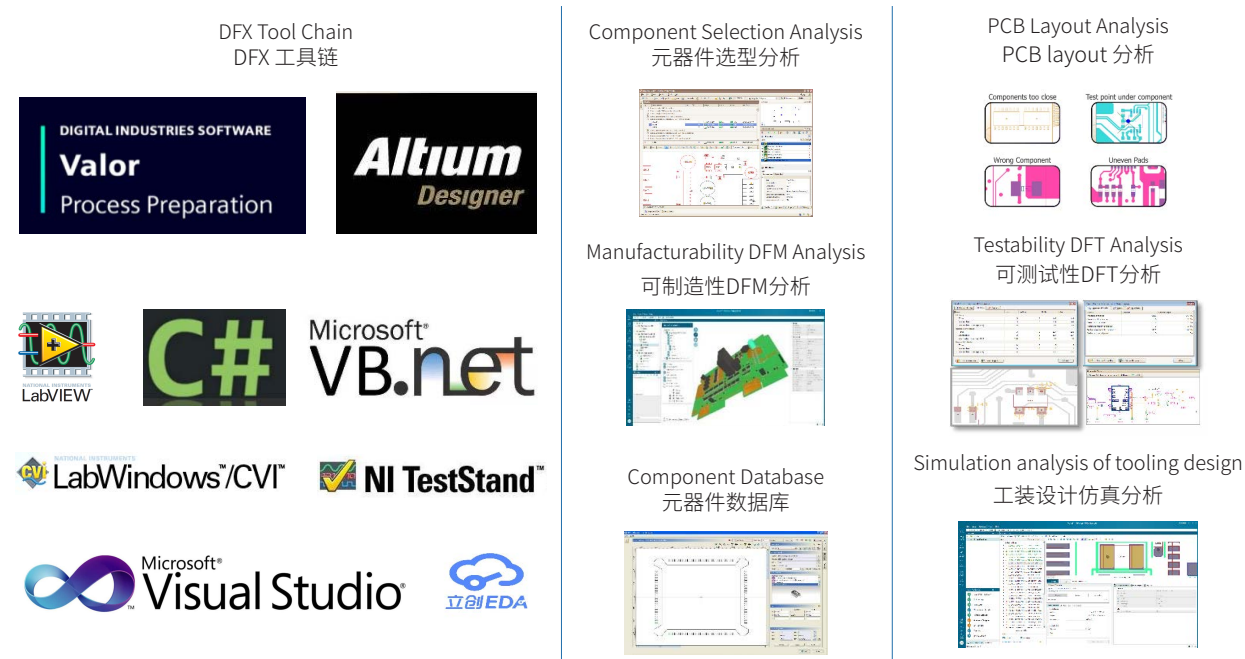
Advanced Information System

制造信息化展示



Manufacturing Tool Chain

制造工具链展示



Quality Assurance

质量能力



Global Layout—— Automotive Electronics

全球布局 —— 汽车电子

Global Supply Chain, Global Operations, and Global Delivery reduce customer risks and enhance agile response.

全球供应链、全球运营、全球交付降低客户的风险及提升敏捷反应

1

Headquarter (Shenzhen)
总部 (深圳)

4

R&D Centers (Shenzhen, Wuhan, Shanghai, Romania)
研发中心 (深圳、武汉、上海、罗马尼亚)

22

Front Offices
前端办公室

22

Service Offices
售后市场

4

Manufacturing Centers
制造中心

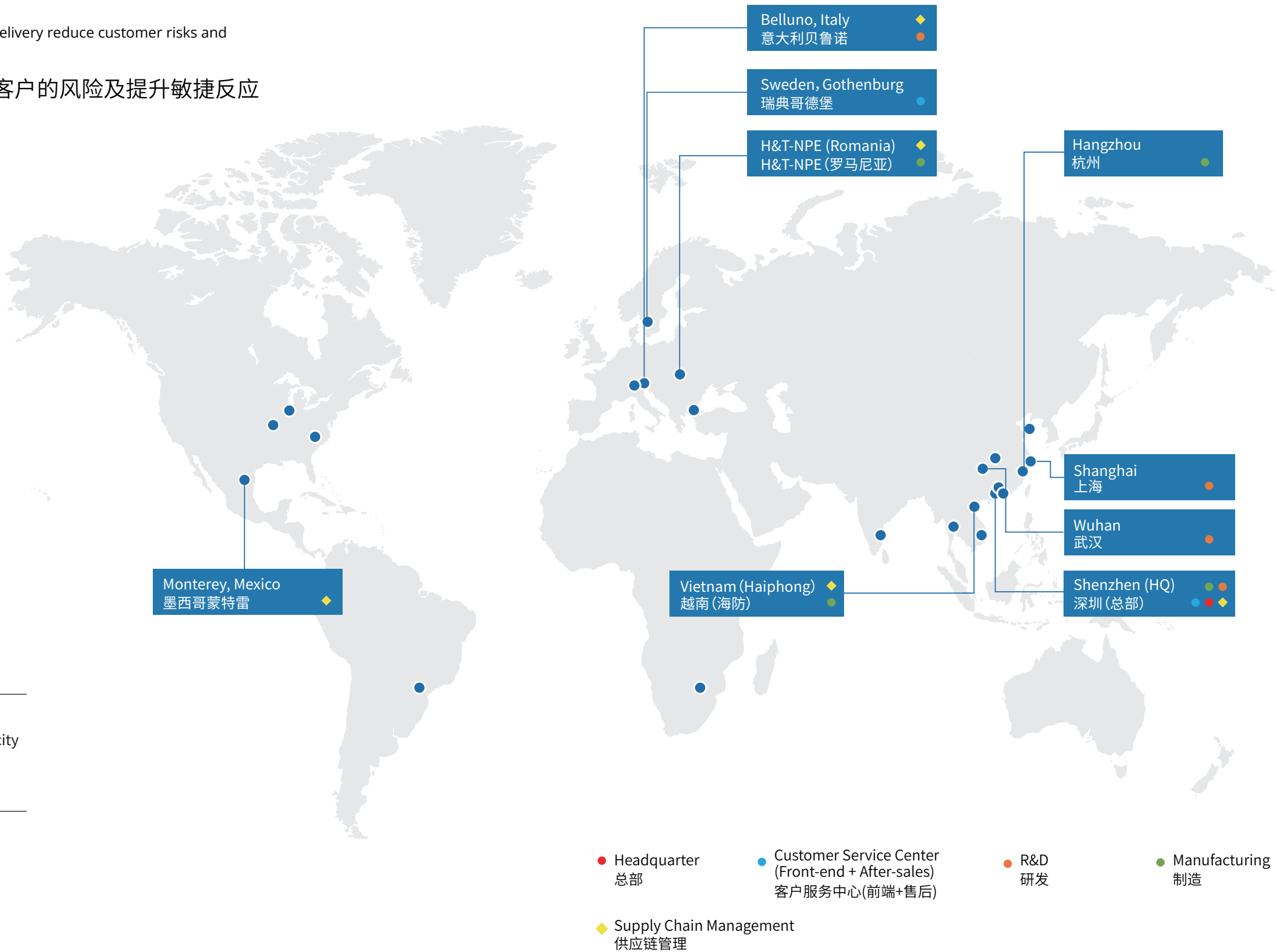
5

Supply Chain Hubs
供应链管理

14条 生产线 (2024)

11.2 million pcs 年产量 (2024)

500,000 m² 总面积



SMART CONTROL, COGNITIVE CABIN

Where Technology Curates Your Third Living Space

Hands Off Detection Controller

离手检测控制器

Intelligent Dimming Glass Controller

智能调光玻璃控制器

Seat Controller Unit

座椅控制器

Body Domain Unit Controller

车身域控制器

Compressor Controller

压缩机控制器

Integrated Module Controller

集成模块控制器

Cockpit Controller

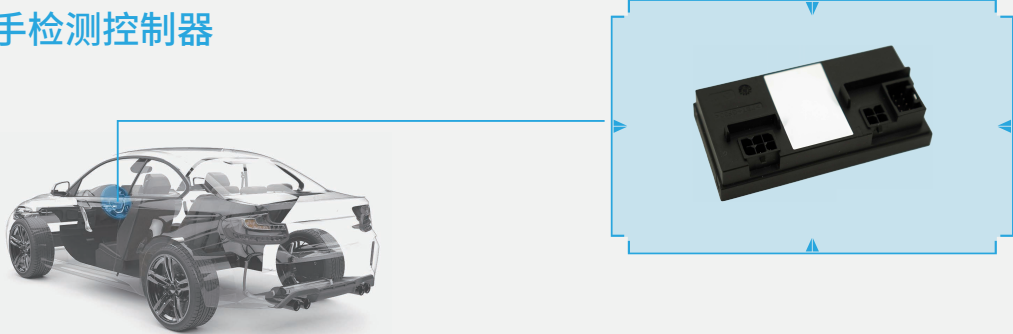
座舱控制器

Battery Backed-up Sounder Controller

电池备用报警控制器

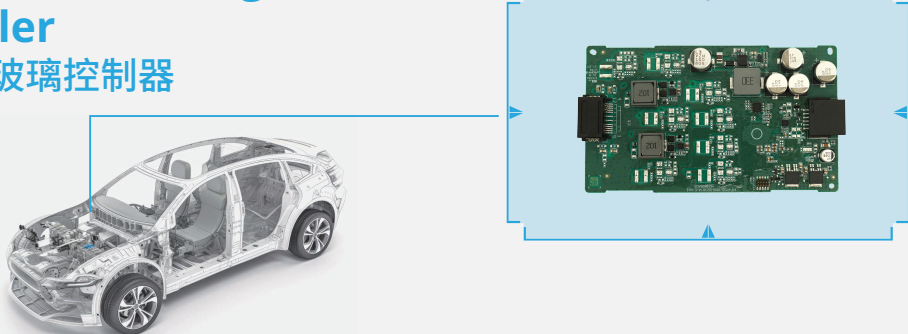
Hands Off Detection Controller

离手检测控制器



Intelligent Dimming Glass Controller

智能调光玻璃控制器



| Application

Driver's hand on/off detection in real time to improve driving safety

| Advantages

- 1. Multi-zone detection
- 2. Time-sharing multiplexing of heating and sensing
- 3. Strong compatibility, matched with a variety of MAT sensor, adapt to various steering wheels

| Features

- 1. High-resolution detection: It can realize the detection function under external pressure-free contact conditions, and can also identify single fingers or knee coverage
- 2. Function expansion: Expandable integrated steering wheel heating and smart button light functions
- 3. Safety specifications: ADAS requirements and ISO26262 ASIL_B

| Parameters

Operating voltage	9V ~16V
Operating temperature	-40°C~85°C
Operating current	<13A / 16V
Power	13.5V 9.89A
Heating speed	-18°C-5°C, <5min; -18°C-22°C, <15min
Heating uniformity	Temperature error between 5 points of the steering wheel <4°C

| 应用价值

实时提醒驾驶员注意驾驶状态, 提高驾驶安全性

| 优势

- 1. 多区检测
- 2. 加热和感应分时复用
- 3. 兼容性强, 可搭配多种传感器垫, 适配各种方向盘

| 特点

- 1. 高分辨率检测: 可在外部无压力接触条件下实现检测功能, 也可识别单个手指或膝盖覆盖
- 2. 功能扩展: 可扩展集成方向盘加热、智能按键灯功能
- 3. 安全规范: 支持ADAS要求和ISO26262 ASIL B

| 产品参数

工作电压	9V ~16V
工作温度	-40°C~85°C
工作电流	<13A / 16V
功率	13.5V 9.89A
加热速率	-18°C-5°C, <5min; -18°C-22°C, <15min
加热均匀度	方向盘5个点位间温度误差<4°C

| Application

Solutions for automotive intelligent sunshade control, and privacy protection

| Advantages

- 1. Applicable to sunroof glass, window glass and rearview mirror anti-glare, etc.
- 2. Applicable to EC, PDLC, LC and other films
- 3. Intelligent gradient dimming, which can be realized manually or automatically

| Features

- 1. 1~10 dimming modes: "1"-brightest, "10"-darkest
- 2. The glass color will be adjusted according to the ambient light intensity in automatic mode

| Parameters

Operating Voltage	9V~16V
Operating temperature	-40°C~85°C
High voltage output	48Vac ± 1Vac @ 55-60Hz
Sleep current	≤0.1mA
Power consumption in sleep mode	13.5V, 23°C, 1.45mW
Protection level	IP5K2

| 应用价值

为车辆提供智能遮阳、隐私保护等控制解决方案

| 优势

- 1. 适用于天窗、车窗玻璃及后视镜防眩目等
- 2. 适用于EC、PDLC、LC等多种膜片
- 3. 智能渐变调光, 可手动或自动实现

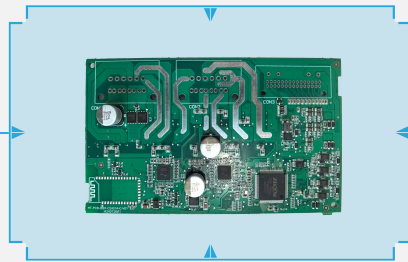
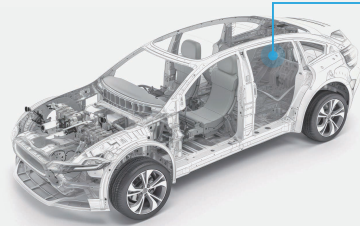
| 特点

- 1. 有1~10级调光模式; 1级最亮, 10级最暗
- 2. 自动模式下会依据环境的光线强度调节玻璃色度

| 产品参数

工作电压	9V~16V
工作温度	-40°C~85°C
高压输出	48Vac ± 1Vac @ 55-60Hz
休眠电流	≤0.1mA
休眠模式下的功耗	13.5V, 23°C, 1.45mW
防护等级	IP5K2

Seat Controller Unit
座椅控制器



| Application

Provides safe and comfortable seat position adjustment function for drivers and passengers

| Advantages

- 1. Sitting habit memory
- 2. Fully automatic electric adjustment
- 3. Door opening and welcoming function
- 4. Extended functions: Passenger on/off assistance, position memory, ventilation and heating, mobile phone APP control

| Features

- 1. 3 modes of seat adjustment
- 2. Thermal protection function
- 3. Safety level: ISO26262 ASIL_B

| Parameters

Operating voltage	9V~16V
Operating temperature	-40°C~85°C
Adjustment method	Up to 12-way adjustment
Mode selection	Zero gravity, camping, theater mode

| 应用价值

为驾驶员和乘客提供安全与舒适的座椅位置调整功能

| 优势

- 1. 客户习惯记忆
- 2. 全自动电动调节
- 3. 开门迎宾功能
- 4. 扩展功能:上下车辅助, 位置记忆, 通风加热, 手机APP控制

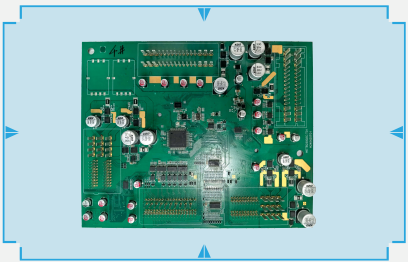
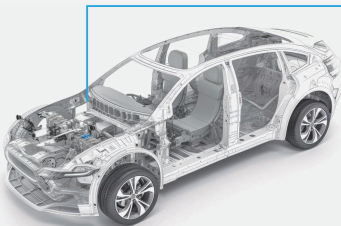
| 特点

- 1. 三种模式座椅调节
- 2. 热保护功能
- 3. 安全规范:ISO26262 ASIL B

| 产品参数

工作电压	9V~16V
工作温度	-40°C~85°C
调节方式	支持多达12向调节
模式选择	支持零重力, 露营, 影院模式

Body Domain Unit Controller
车身域控制器



| Application

Centralized management of vehicle systems to improve vehicle integration

| Advantages

- 1. Highly integrated vehicle input and output, power distribution optimization, and wiring harness optimization
- 2. Integrate BCM body control function, PEPS function, and TPMS function

| Features

- 1. Classic AUTOSAR software architecture
- 2. ASIL B/D for functional safety
- 3. Cybersecurity: HSM, Security Boot, SecOC
- 4. OTA: AB partition and non-sensing flashing

| Parameters

Operating Voltage	6V~18V
Operating temperature	-40°C~85°C
Static current	<1.0mA, room temperature conditions
Protection level	IP5K2

| 应用价值

集中管理车辆各系统, 提高车辆的集成性

| 优势

- 1.高度集成整车的输入输出以及配电优化、线束优化
- 2.集成:BCM 车身控制功能、PEPS功能、TPMS功能

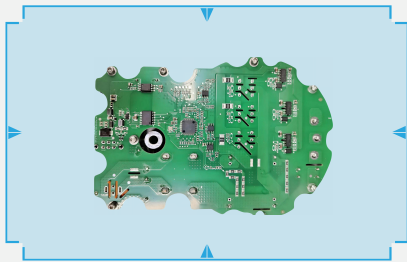
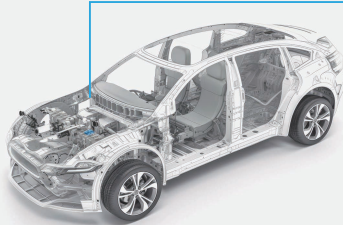
| 特点

- 1. 采用完整的Classic AUTOSAR软件架构
- 2. 功能安全可支持ASIL B/D等级
- 3. 信息安全:HSM, 支持Security Boot, SecOC
- 4. OTA:AB分区及无感刷写

| 产品参数

工作电压	6V~18V
工作温度	-40°C~85°C
静态电流	<1.0mA, 常温条件
防护等级	IP5K2

Compressor Controller
压缩机控制器



| Application

Ensure stable and efficient operation of vehicle air conditioning and thermal management system

| Advantages

- 1. Hardware platformization, extremely cost-effective
- 2. 400V/800V compatible
- 3. Excellent starting characteristics (2.8MPa)
- 4. High heat dissipation efficiency
- 5. Integrate heater to achieve dual-purpose

| Features

- 1. Integrated bracket design, AUTOSAR architecture
- 2. Self-developed FOC motor algorithm
- 3. LIN/CAN communication
- 4. UDS, OTA upgrade

| Parameters

Operating Voltage	9V~16V
Operating temperature	-40°C~125°C
Applicable displacement	2733/40/46/55 cc
Applicable voltage platform	400V/800V
Rotation range	500~12000rpm
Single-core MCU	

| 应用价值

确保车辆空调或热管理系统的稳定与高效运作

| 优势

- 1. 硬件平台化, 成本可控
- 2. 400V/800V兼容
- 3. 启动特性优 (2.8MPa)
- 4. 高散热效率
- 5. 可集成加热器, 实现一机两用

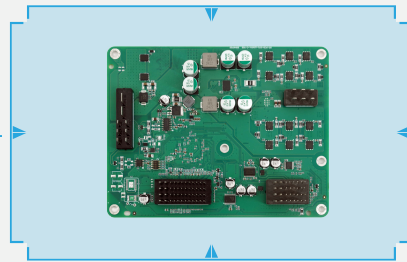
| 特点

- 1. 采用一体化支架, 基于AUTOSAR开发
- 2. 自研FOC电机算法
- 3. 支持LIN/CAN通讯
- 4. 支持UDS, OTA升级

| 产品参数

工作电压	9V~16V
工作温度	-40°C~125°C
适配排量	2733/40/46/55 cc
适配电压平台	400V/800V
转速范围	500~12000rpm
单核MCU	

Integrated Module Controller
集成模块控制器



| Application

Provide integration, communication and management functions for various vehicle systems, and optimize vehicle thermal system management.

| Advantages

- 1. Highly integrated: Integrate all low-voltage components and signal acquisition of the thermal management system
- 2. Platformization hardware solution
- 3. 3*BLDC simultaneous control algorithm
- 4. High scalability, expandable to full-drive control of the thermal management system
- 5. Capable of independently developing software

| Features

- 1. 3-way water pump integration
- 2. 3-way water valve integration
- 3. Support 2 CAN/2 LIN communication
- 4. Support UDS, OTA upgrade

| Parameters

Operating voltage	9V~16V
Operating temperature	-40°C~105°C
Water pump power	200W, 120W, 100W
Water valve power	10W*3
ARM dual-core processor	

| 应用价值

为车辆各个系统提供集成、通信和管理功能, 优化车辆热系统管理

| 优势

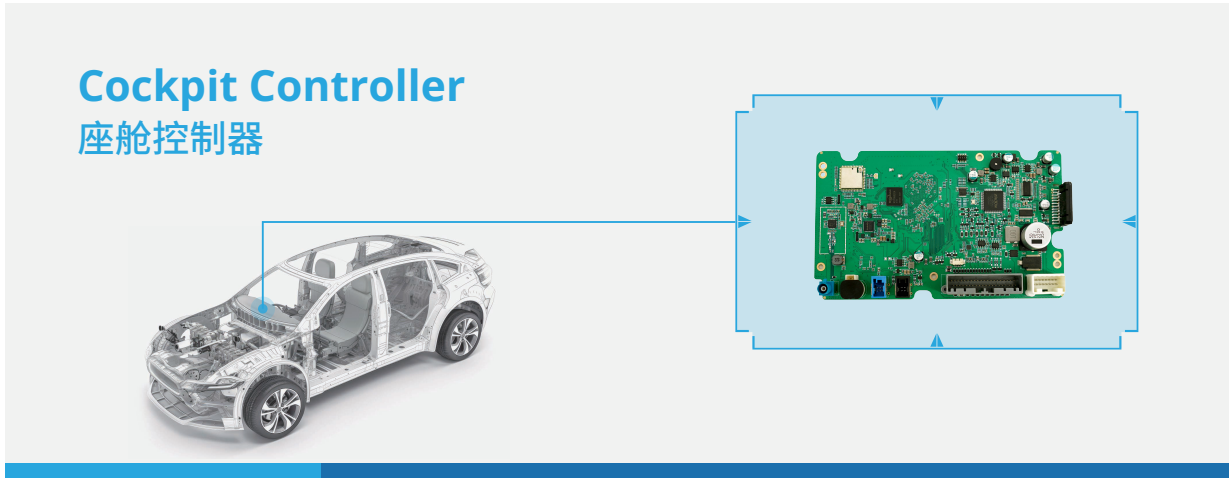
- 1. 高度集成: 集成热管理系统所有低压部件及信号采集
- 2. 平台化硬件方案
- 3. 3*BLDC同时控制算法
- 4. 可扩展性高, 可扩展至热管理系统全驱控制
- 5. 主机厂可自己基于PCBA开发算法

| 特点

- 1. 3路水泵集成
- 2. 3路水阀集成
- 3. 支持2 CAN/2LIN通信
- 4. 支持UDS, OTA升级

| 产品参数

工作电压	9V~16V
工作温度	-40°C~105°C
水泵功率	200W, 120W, 100W
水阀功率	10W*3
ARM双核处理器	



| Application

As the third living space, it supports multi-modal interaction to reduce distraction, full-scenario environmental adaptation, etc.

| Advantages

- 1. High-performance SOC, extremely cost-effective
- 2. Single host to realize the central control and instrumentation functions
- 3. Extensive support for mainstream industry applications

| Features

- 1. High-performance cockpit platform, extremely cost-effective
- 2. A/B Partitioning with Seamless OTA Updates
- 3. Instrument cluster functionalities comply with ASIL-B requirements

| Parameters

Operating voltage	9V~32V
Nominal voltage	12V/24V
Operating temperature	-35°C~80°C
Storage temperature	-40°C~85°C
Static current	≤3mA
Switch-on time	Quick start within 8 seconds, cold start ≤18 seconds
Memory	RAM≥4GB
Storage	ROM≥32GB

| 应用价值

作为第三空间,支持多模态交互减少分心、全场景环境自适应等

| 优势

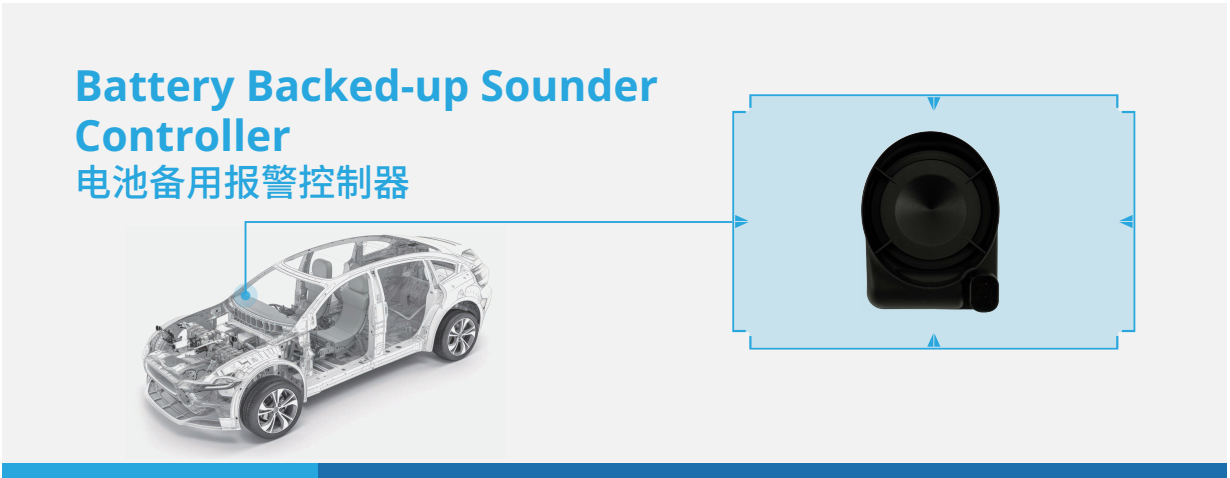
- 1. 国产高性能SOC, 极具性价比
- 2. 单一主机实现中控和仪表功能
- 3. 支持丰富的行业主流应用场景

| 特点

- 1. 国产高性能座舱平台, 极致性价比
- 2. OTA:AB分区及无感刷写
- 3. 安全规范:仪表相关功能满足ASIL-B等级

| 产品参数

工作电压	9V~32V
标称电压	12V/24V
工作温度	-35°C~80°C
储存温度	-40°C~85°C
静态电流	≤3mA
开机时间	快速启动8秒以内, 冷启动≤18秒
内存	RAM≥4GB
存储器	ROM≥32GB



| Application

As a sensor and sounder, it is used in vehicle anti-theft alarm systems to provide reliable protection for vehicle safety

| Advantages

- 1. Platform solution design, short R&D cycle, extremely cost-effective
- 2. Cybersecurity: ISO/SAE 21434

| Features

- 1. Capable of generating multi-tone alarm signals
- 2. Capable of detecting tampering attempts on the alarm unit
- 3. Capable of precise detection of vehicle movement

| Parameters

Operating voltage	9V~16V
Operating temperature	-40°C~85°C
Static current	100uA
Operating current	270mA
Protection level	IP6K7

| 应用价值

作为传感器和发声器,应用于车辆防盗报警系统中,为车辆安全提供可靠保障

| 优势

- 1. 平台化方案设计, 研发周期短, 成本优势高
- 2. 信息安全按照 ISO/SAE 21434流程开发

| 特点

- 1. 可以输出多频警报声音信号
- 2. 可以检测对报警器本身的攻击行为
- 3. 可以 精准探测车辆位置移动

| 产品参数

工作电压	9V~16V
工作温度	-40°C~85°C
静态电流	100uA
工作电流	270mA
防护等级	IP6K7

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 0755
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 automotive.sales@szhittech.com
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 深圳市光明区玉塘街道和而泰大道和而泰工业园
H&T Industrial Park, Yutang Street, Guangming District, Shenzhen