



安世亚太新能源汽车解决方案

目录

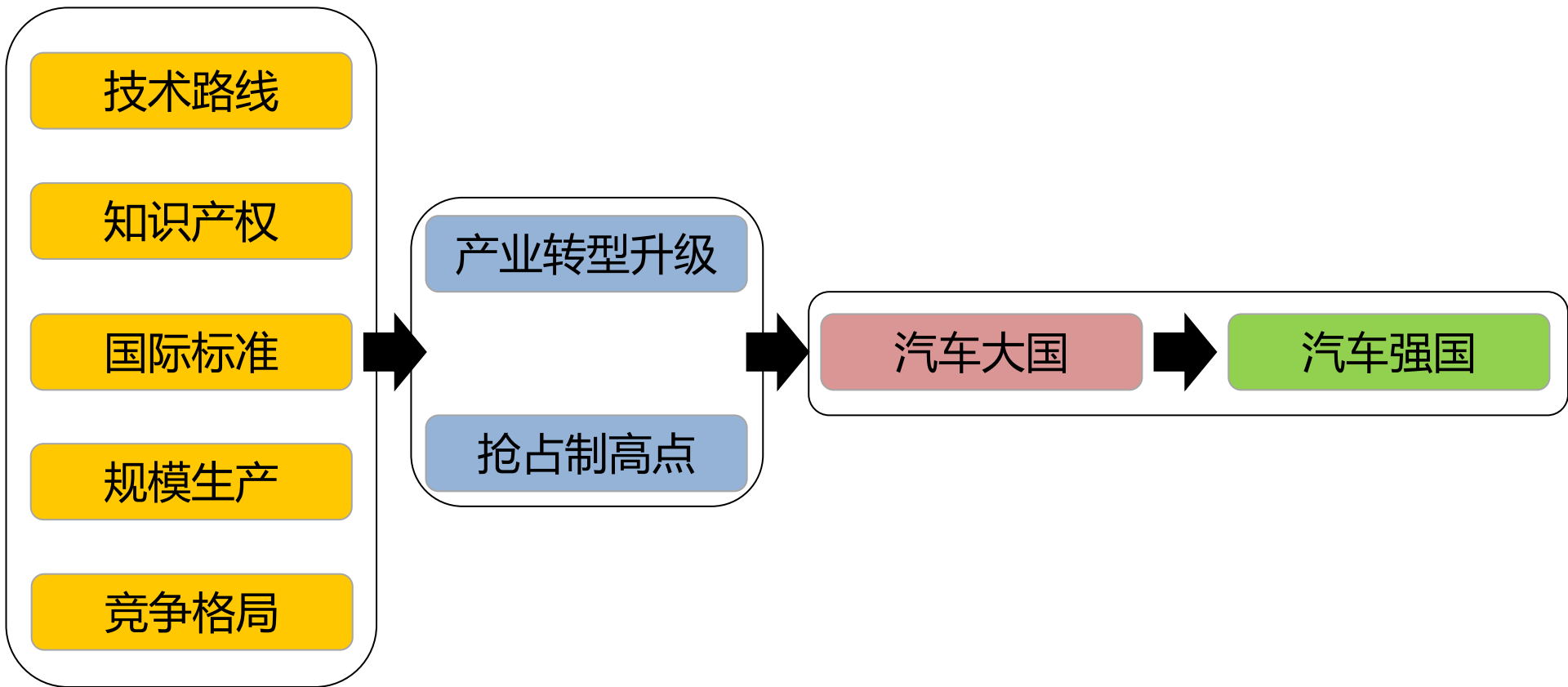
新能源汽车发展趋势 安世亚太仿真分析解决方案

目录

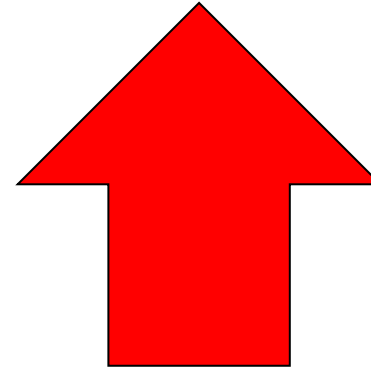
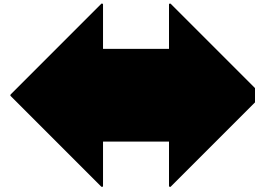
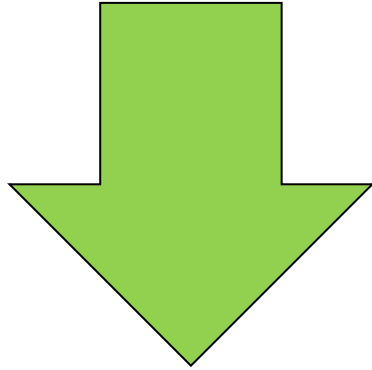
新能源汽车发展趋势

安世亚太仿真分析解决方案



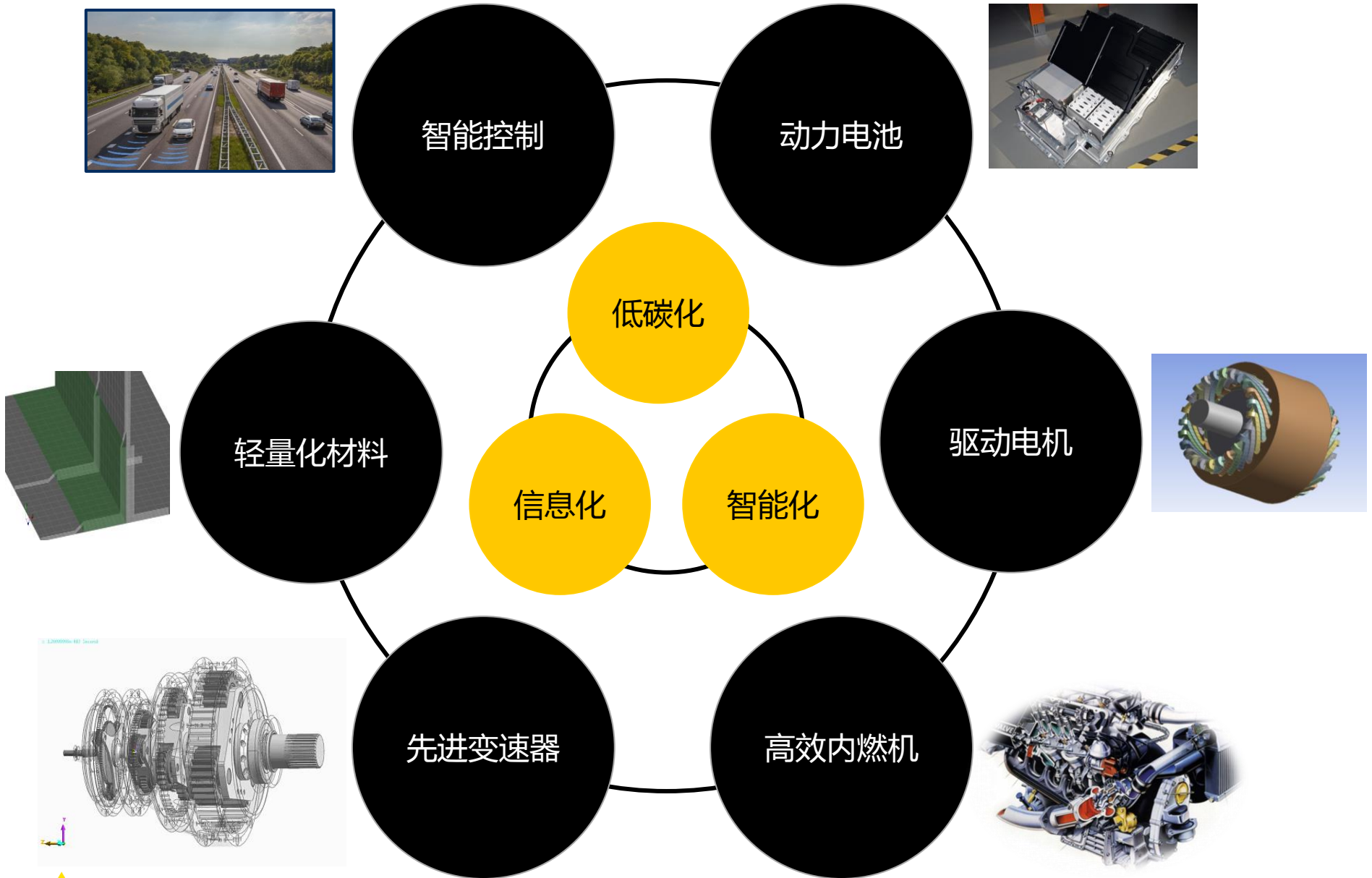


政策补贴



行业发展

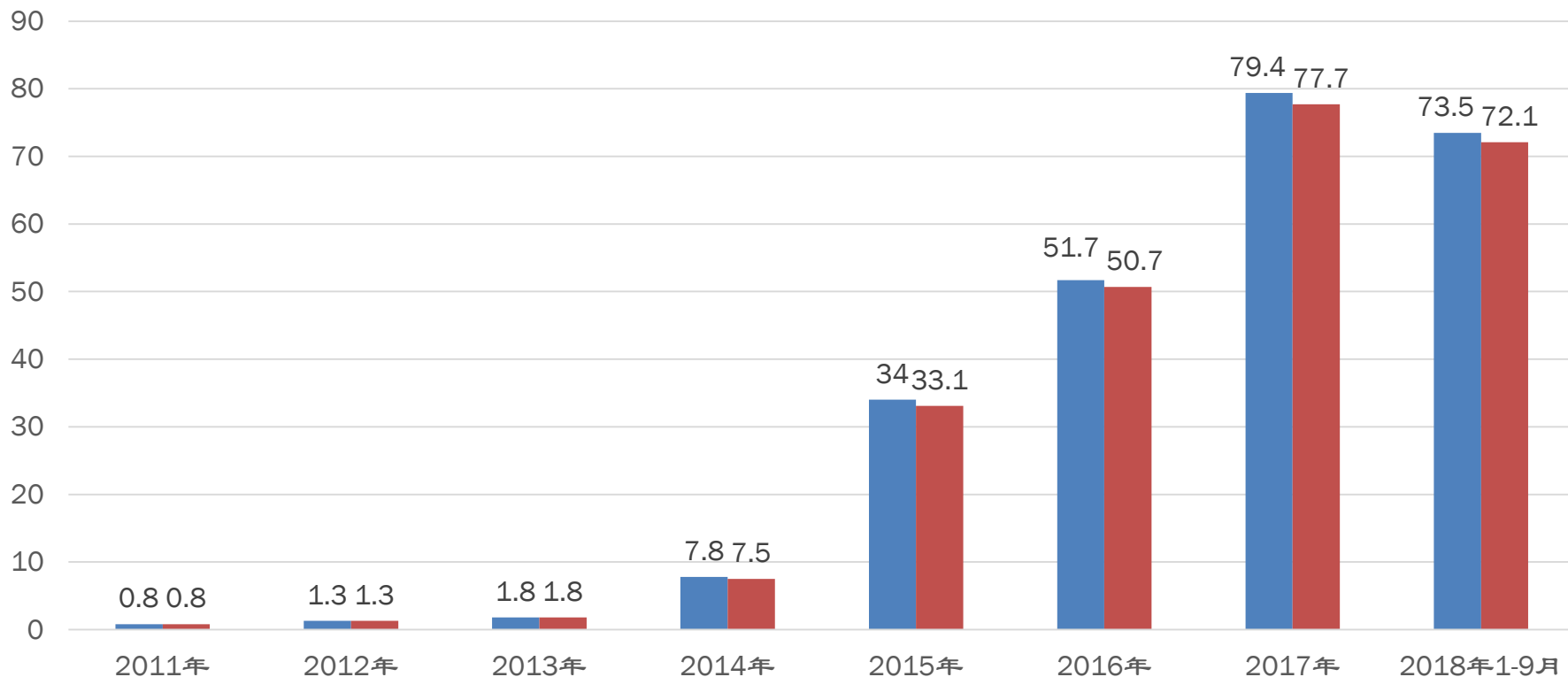


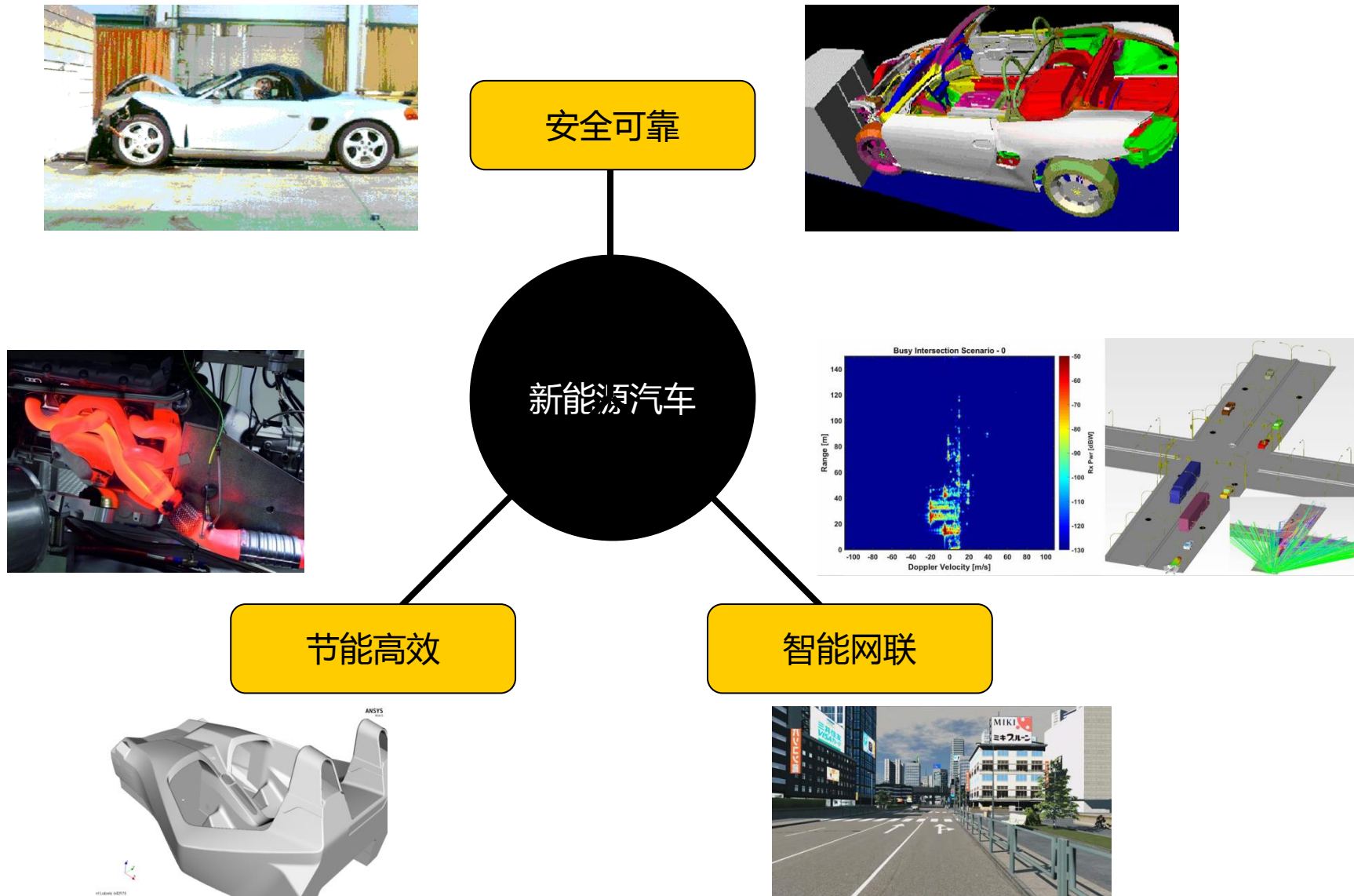


■ 消费者对新能源汽车的认同程度在不断提高

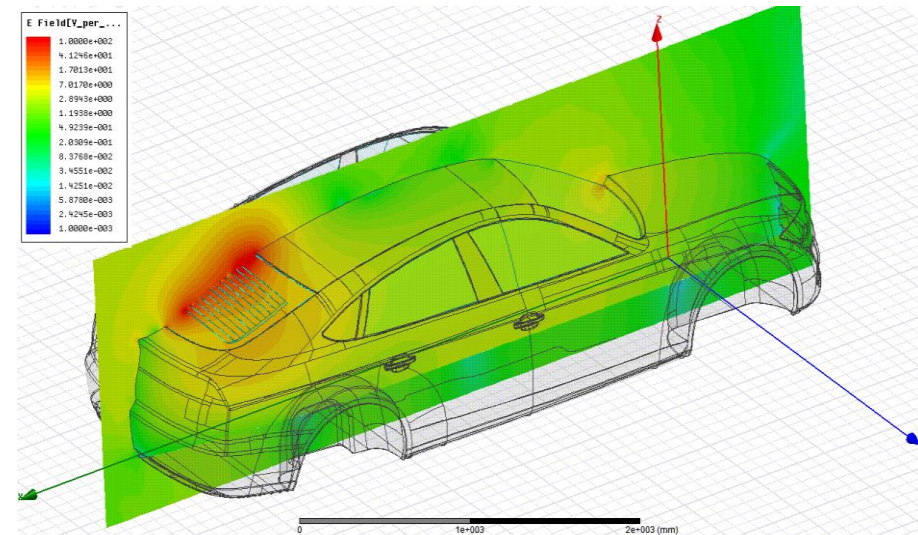
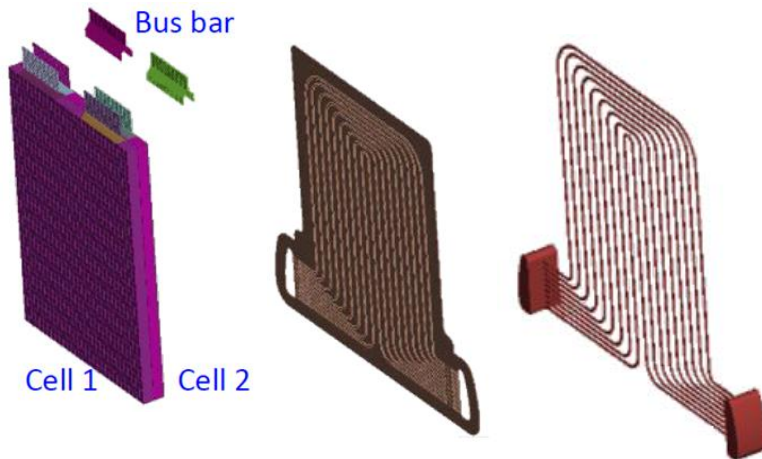
中国新能源车产销量统计

■ 新能源车产量(万辆) ■ 新能源车销量(万辆)

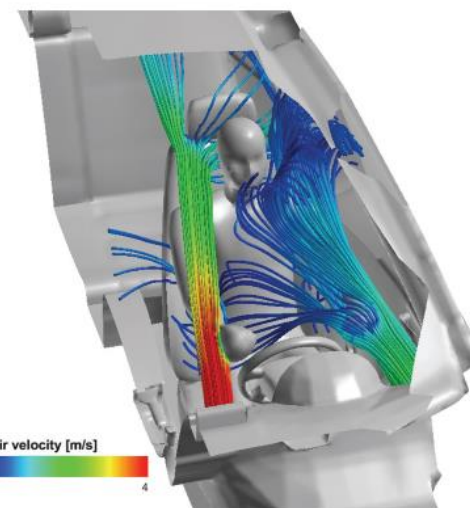
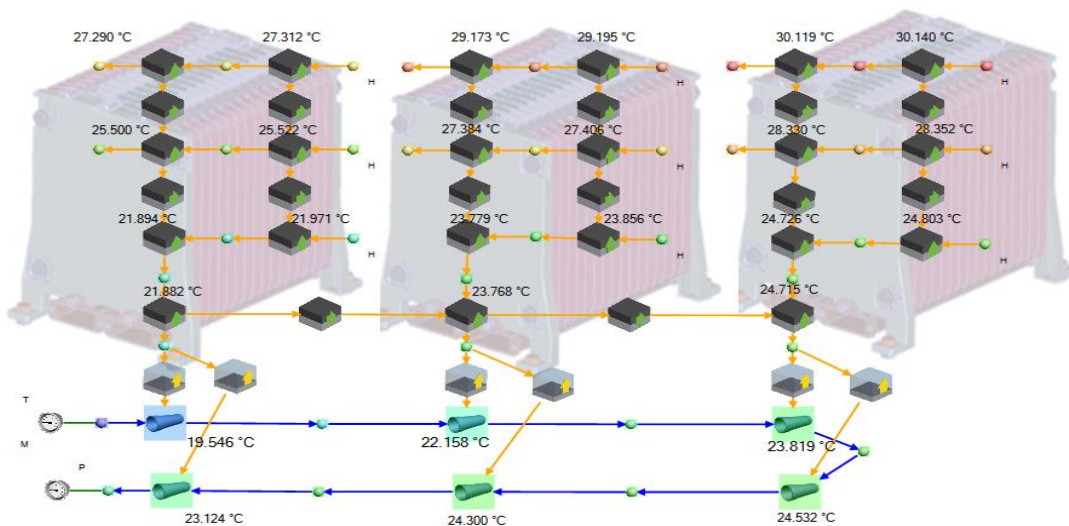
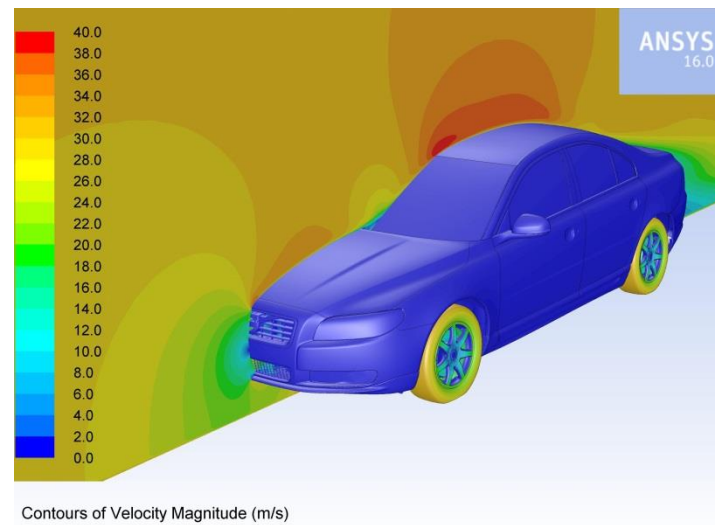




- 动力电池电化学及热设计
- 电池包结构分析优化
- 电动汽车被动安全
- 电动汽车整车结构耐久
- 电磁兼容性兼容性分析
- ECU中PCB单板的电子及热可靠性







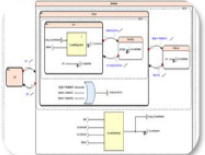

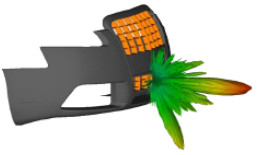
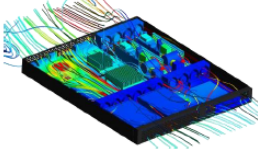


- 电动汽车动力性经济性
- 整车外流场
- 纯电动汽车整车热管理(1D & 3D)
- 轻量化设计与优化
- 驱动电机设计与优化



- 自动驾驶系统开发仿真
- 内外饰设计光学仿真

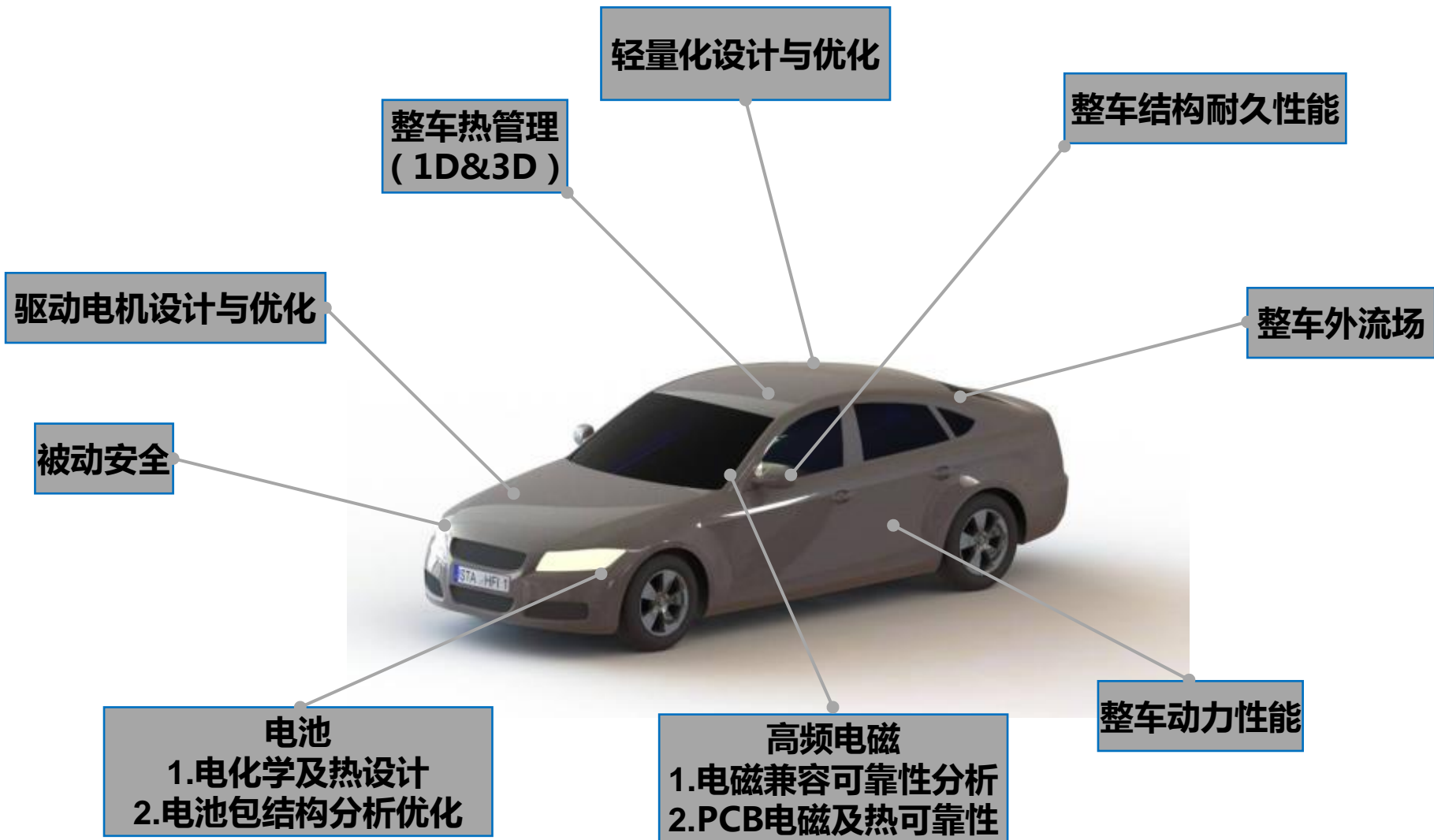
ANSYS Autonomous Vehicle Simulation Platform

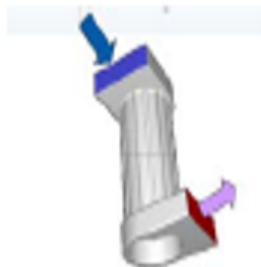
| System Simulation | Control & HMI Software | Functional Safety | Sensor Modeling | Hardware Simulation |
|--|--|---|--|---|
|  |  |  |  |  |
|  |  |  |  |  |
| <p>Simulate driving scenarios with detailed physics. Virtually test control algorithms, sensor accuracy and vehicle dynamics</p> | <p>Develop ISO26262 qualified, AUTOSAR compliant control and HMI software with model based development tools</p> | <p>Ensure safety of automated systems by providing state-of-the-art reliability <i>analysis methods</i>, using simulation for <i>verification</i></p> | <p>Accurately model radars, lidars, V2X communication, GPS antennas, ultrasonic and other sensors with high-fidelity physics</p> | <p>Optimize signal integrity and thermal, structural, electro-magnetic reliability of semiconductors, electronics and mechanical hardware</p> |
| <p>Integrated development with a common platform ♦ Faster development ♦ Better optimized overall product ♦ Cost economy ♦ Better quality</p> | | | | |

目录

新能源汽车发展趋势

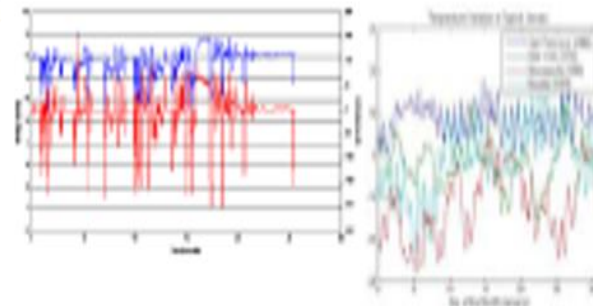
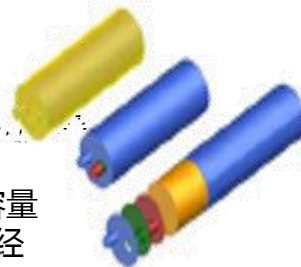
安世亚太仿真分析解决方案





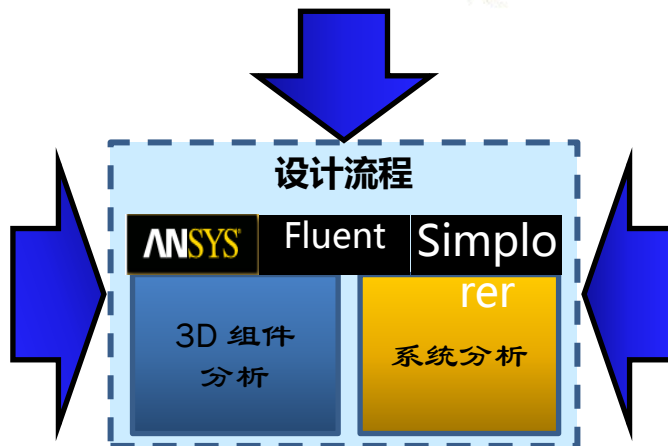
电芯性能

- 形状：片状/圆柱
- 材料
- 尺寸/规模/容量
- 热流/电流路径



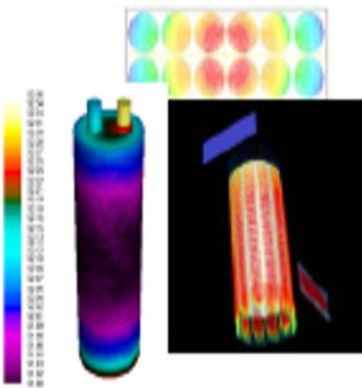
模组冷却方案

- 带相变的被动冷却
- 冷却介质：空气/水
- 接触类型：直接/间接
- 单通道/多通道冷却
- 模组形状/规模
- 内部冷却通道设计
- 冷却介质流量



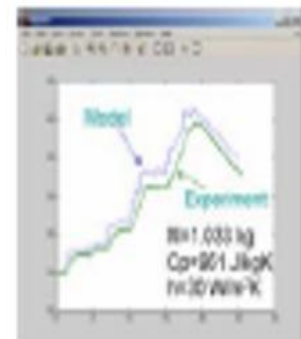
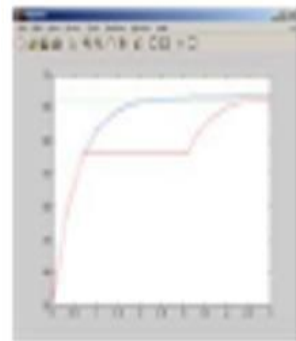
运行条件

- 车辆行驶工况
- 控制策略
- 环境温度
-

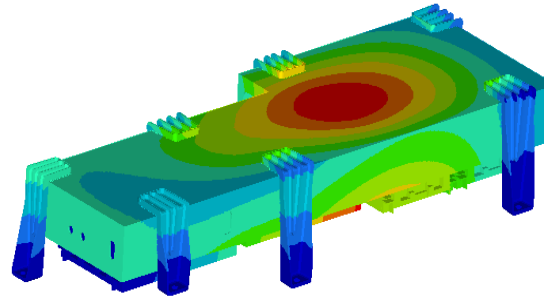


电池热响应

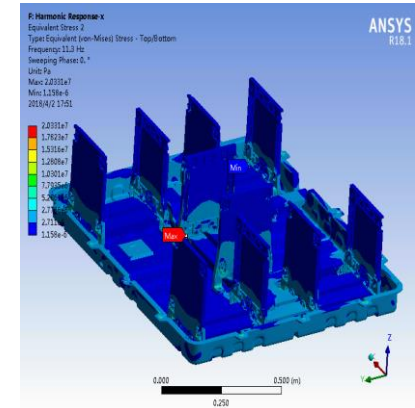
- 温度响应 电芯/模组/Pack
- 电芯单体上温度分布
- 模组内部电池单体的温度不平衡
- 电池性能预测
-



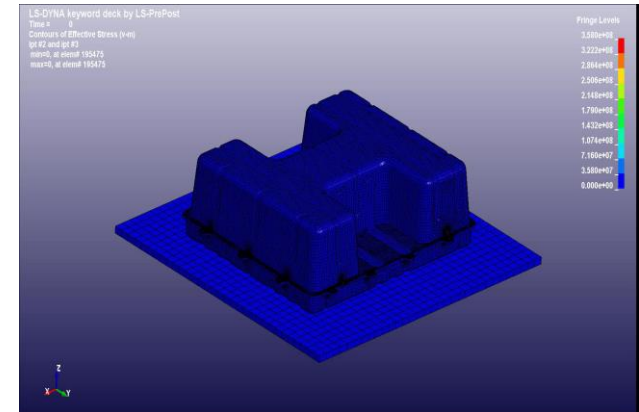
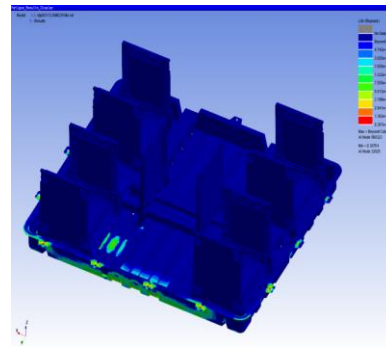
| 电池包安全性测试 | |
|----------|-----------------|
| 1 | 静力分析 (刹车、转弯等) |
| 2 | 模态分析 |
| 3 | 振动实验 |
| 4 | 机械冲击 |
| 5 | 跌落 |
| 6 | 模拟碰撞 |
| 7 | 挤压 |
| 8 | 翻转 |
| 9 | 温度冲击 |
| 10 | 底部球击 |



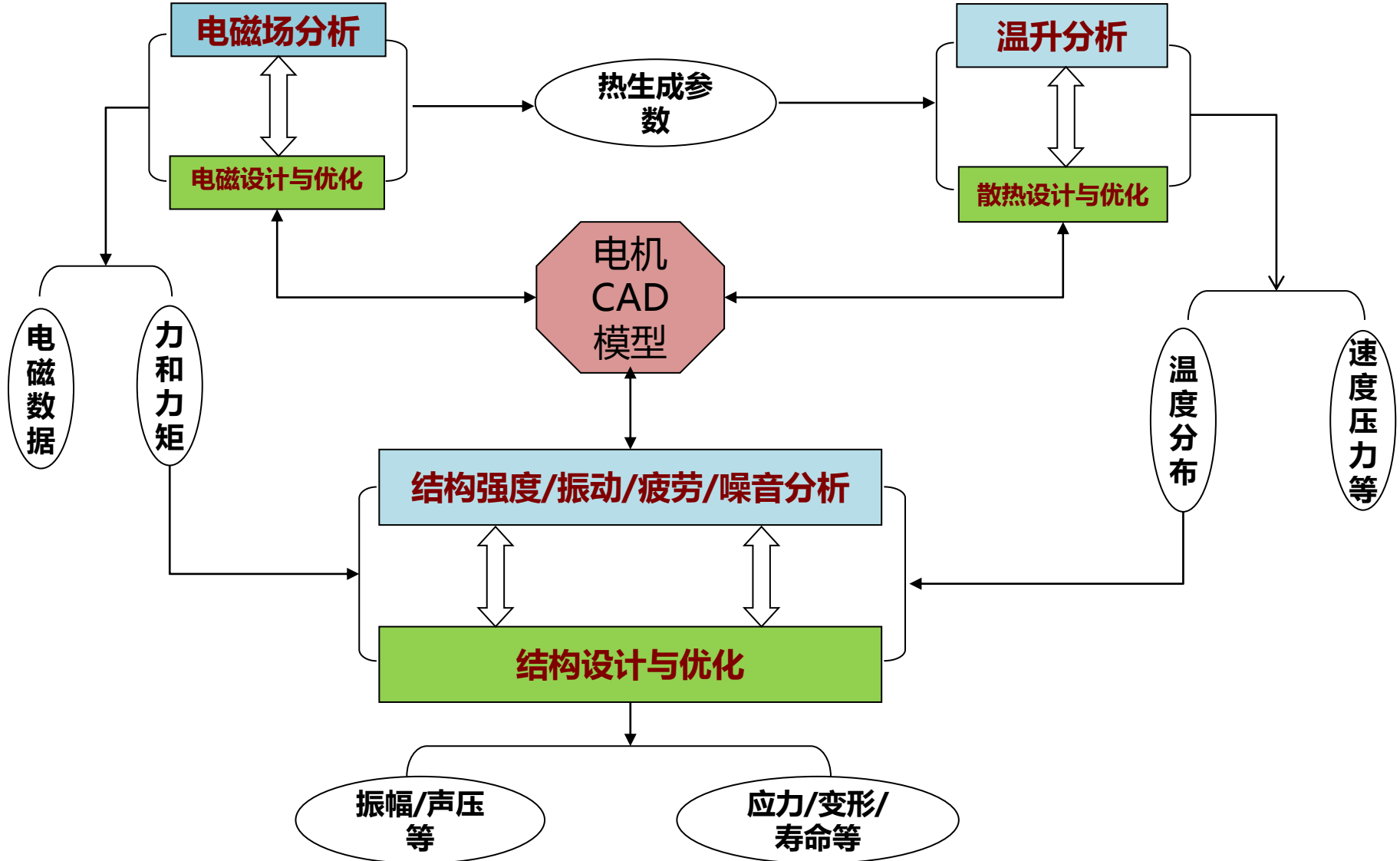
电池包模态分析 (Mechanical)



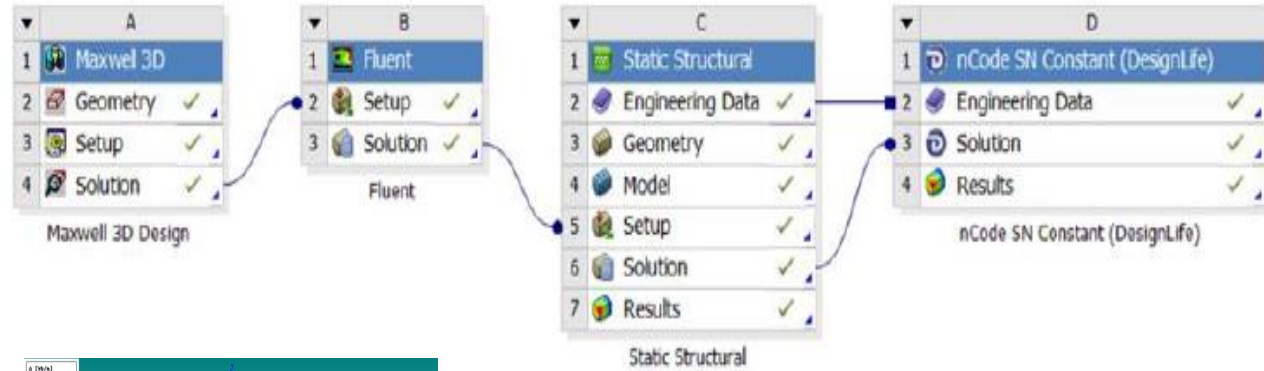
电池包谐振分析 (Mechanical)



电池包振动疲劳分析 (ANSYS nCode DesignLife)

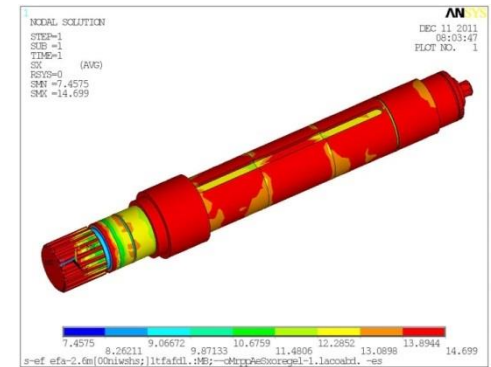
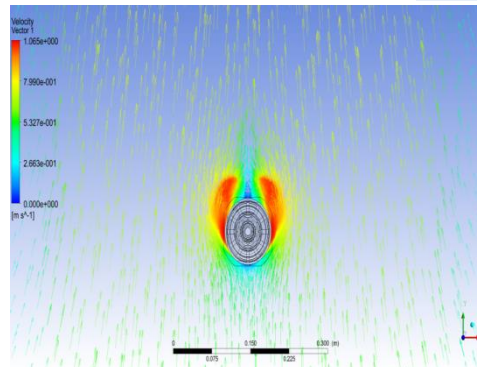
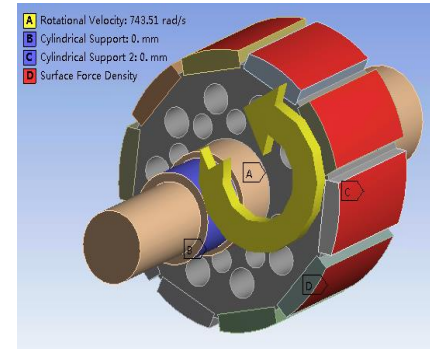
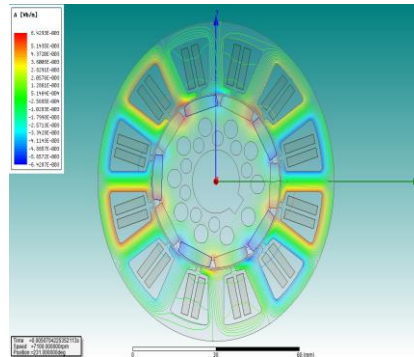


1. 电磁场分析
2. 强度与疲劳分析
3. 振动与噪音分析
4. 散热分析
5. 系统仿真

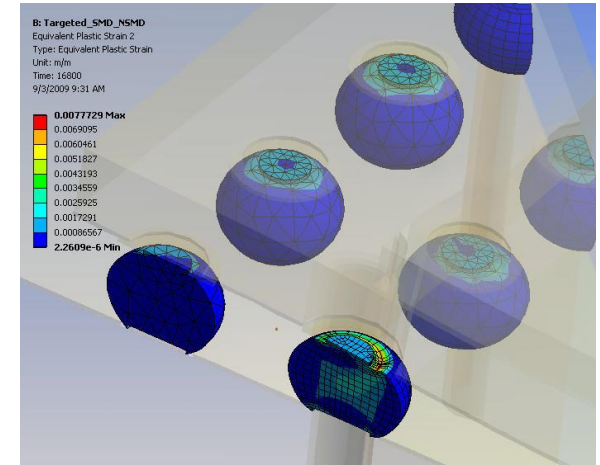
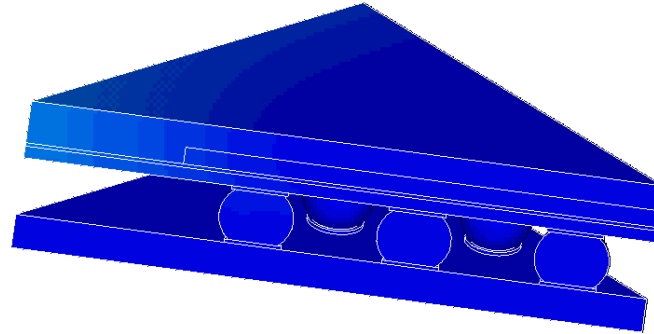


Solution

- ANSYS Maxwell
- ANSYS Mechanical
- ANSYS nCode DesignLife
- ANSYS CFD
- ANSYS Simplorer
- ANSYS HPC



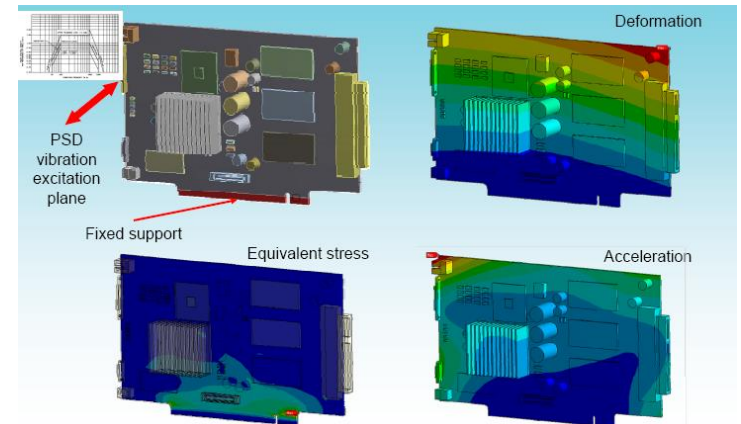
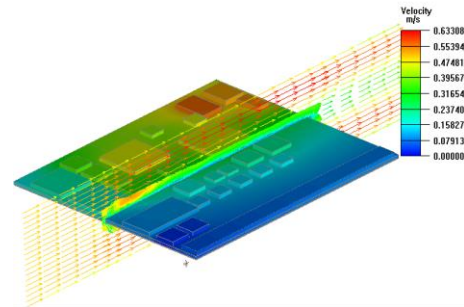
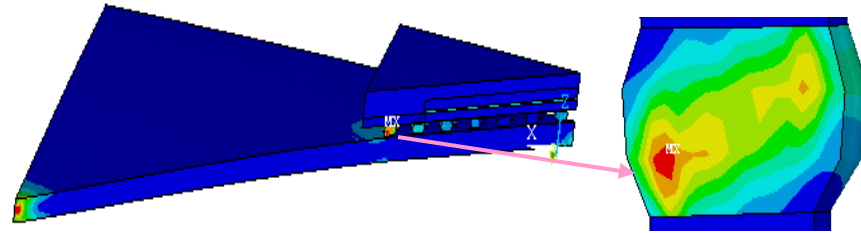
1. 翘曲
2. 界面分层
3. 塑性变形
4. 开裂
5. 散热



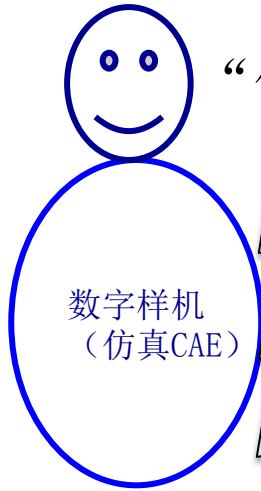
PERA Thermal Mechanical 2008

Solution

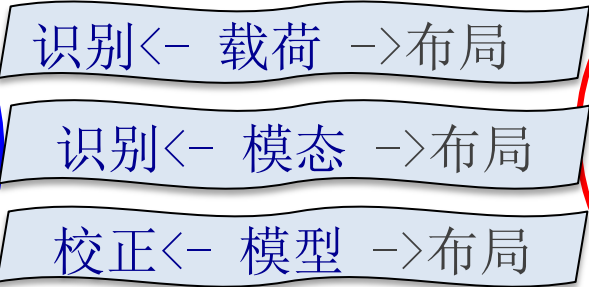
- ANSYS Icepak
- ANSYS Mechanical
- ANSYS nCode DesignLife



1. 应变片贴放位置优化
2. 结构全域应力应变数据
3. 载荷谱获取

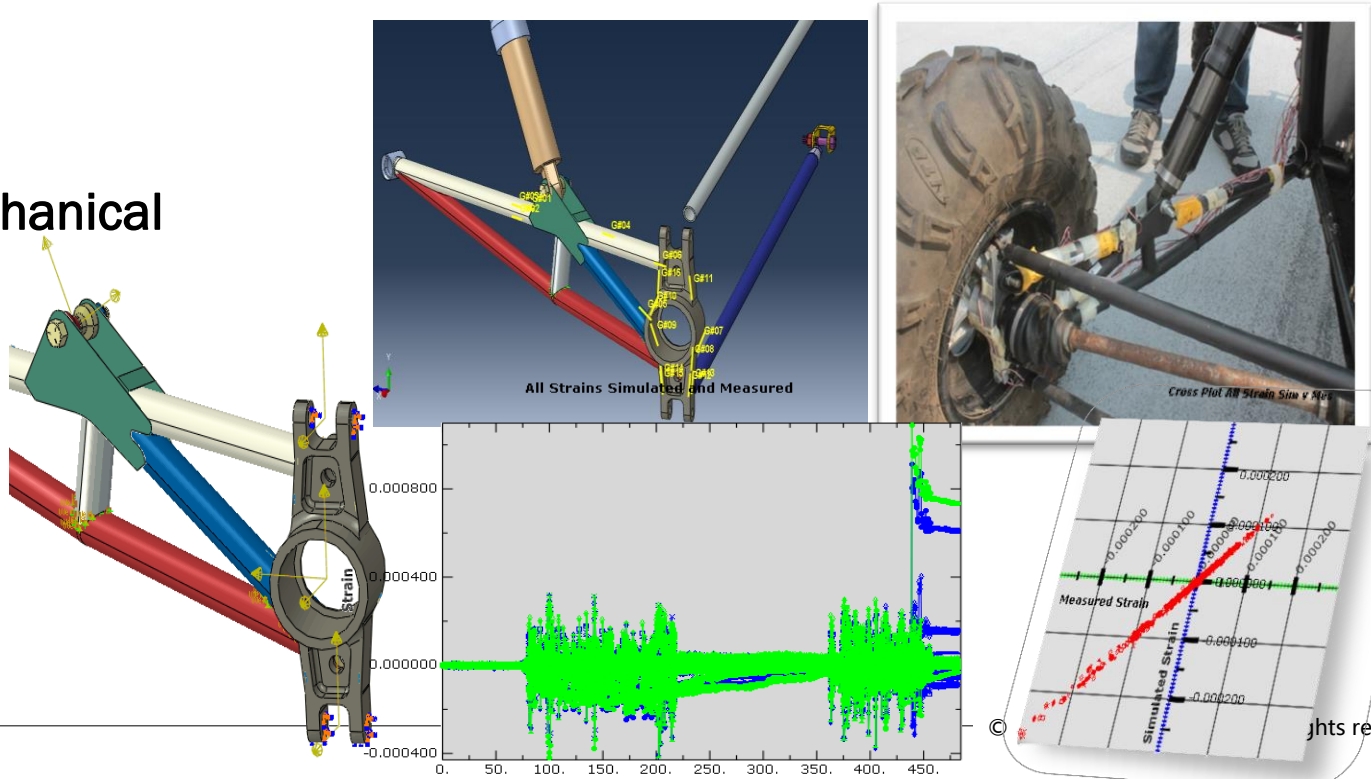


“仿真与测试间的数据纽带”



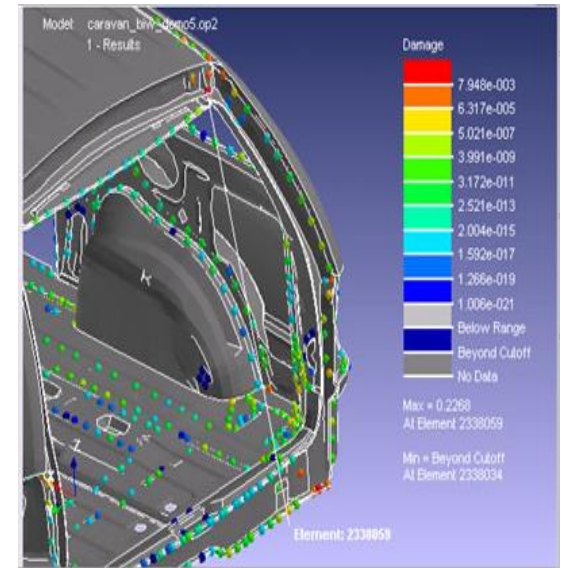
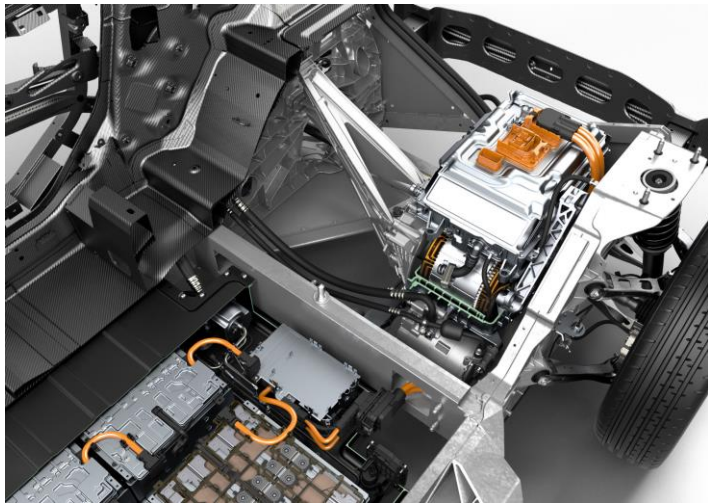
Solution

- ANSYS Mechanical
- TRUE LOAD



白车身

1. 静力学/动力学分析
2. 焊点、焊缝分析
3. 冲击碰撞
4. 疲劳寿命

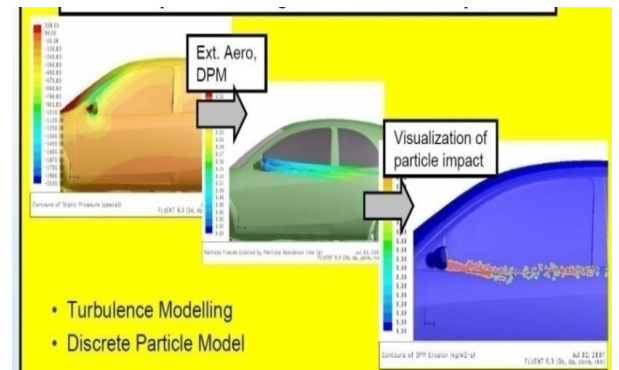
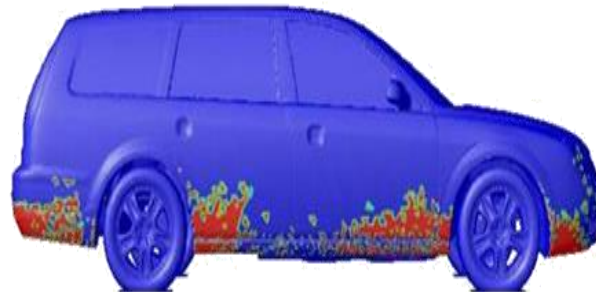
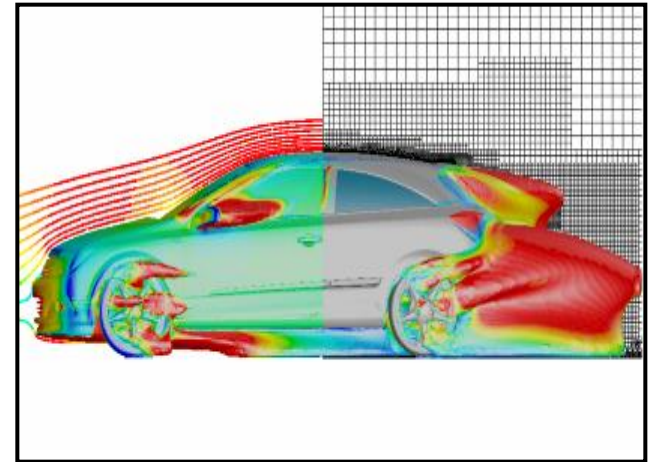
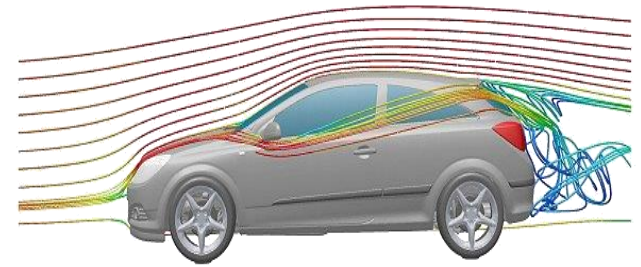


外部CFD

1. 阻力、升力、侧向力
2. 前端进气
3. 泥/水附着、飞溅
4. 车辆涉水

Solution

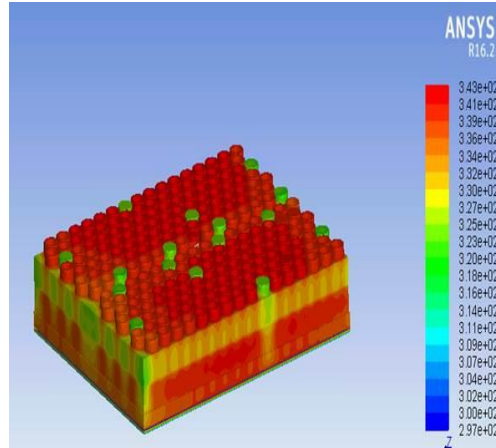
- ANSYS CFD
- ANSYS HPC



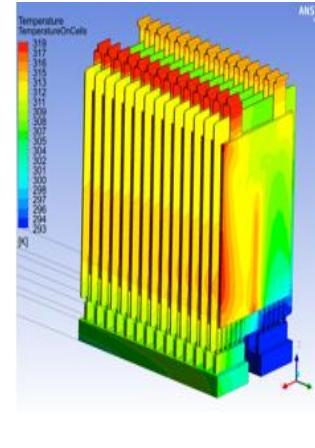
1. 电池包温度分析
2. 驾驶舱通风及乘员舒适性分析
3. 控制系统仿真
4. 设计优化

Solution

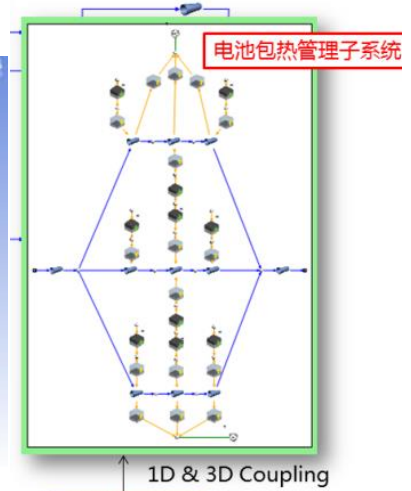
- Flownex
- ANSYS Fluent
- ANSYS Icepak



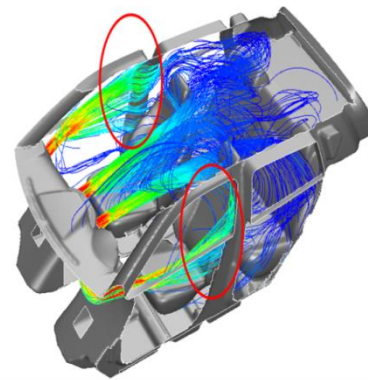
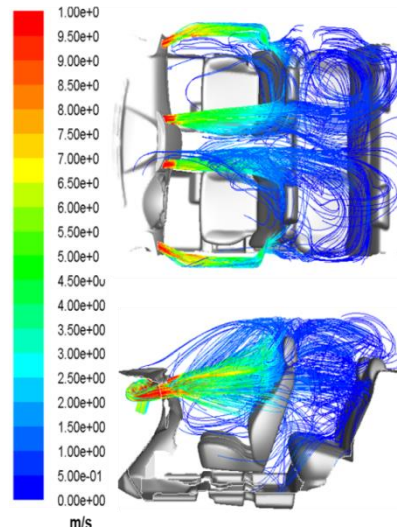
电池包温度分布



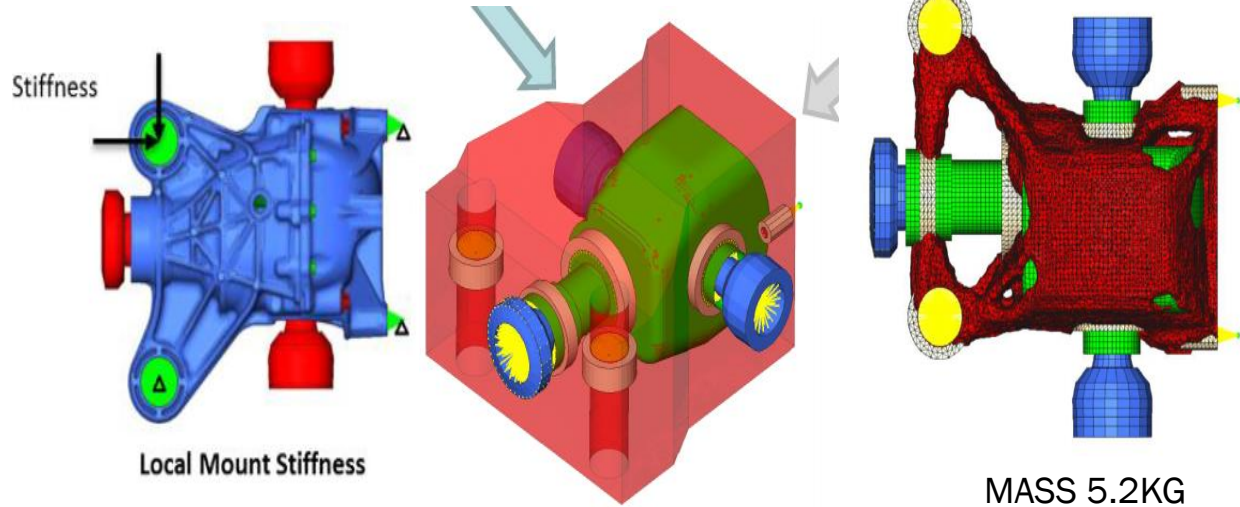
电芯表面温度分布



电池包一维热仿真



1. 零部件轻量化
2. 整车轻量化
3. 复合材料

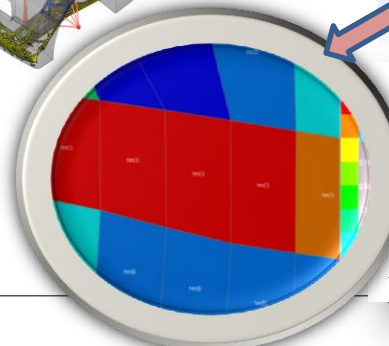
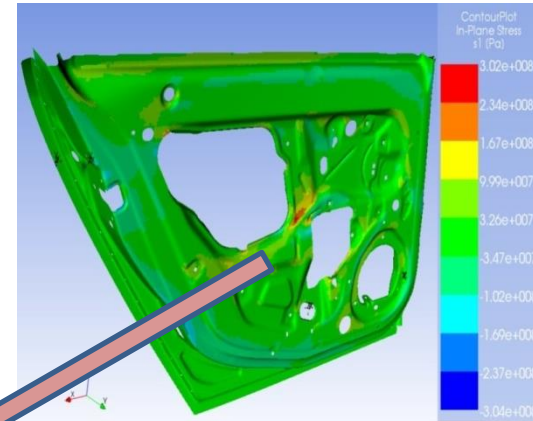
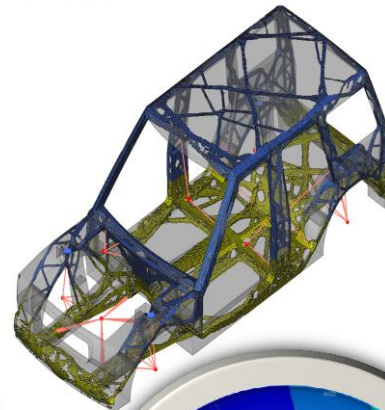
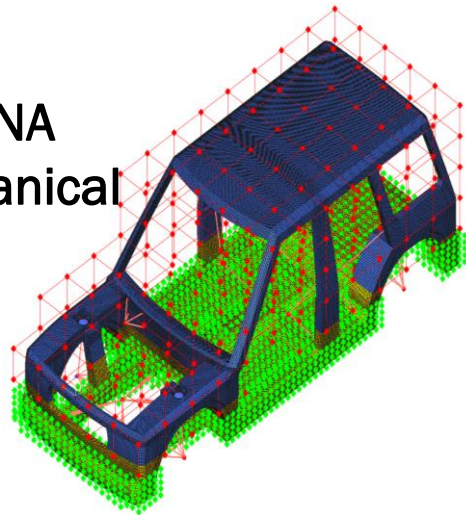


MASS 7.8KG

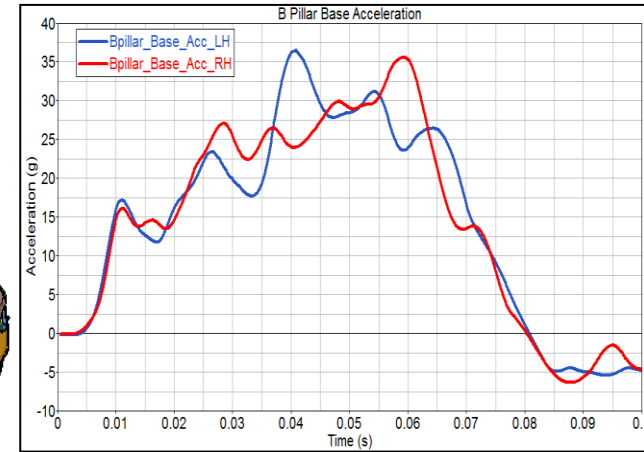
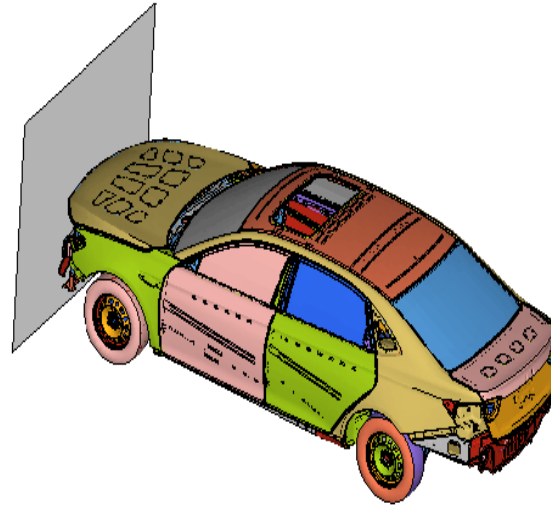
TOPOLG: REGION ELEMENT LENGTH: DESIGN CYCLE NUMBER = 26
Isosurface enclosing 13% of topology region

Solution

- ANSYS LS DYNA
- ANSYS Mechanical
- ANSYS ACP
- GENESIS
- optisLang
- ANSYS HPC



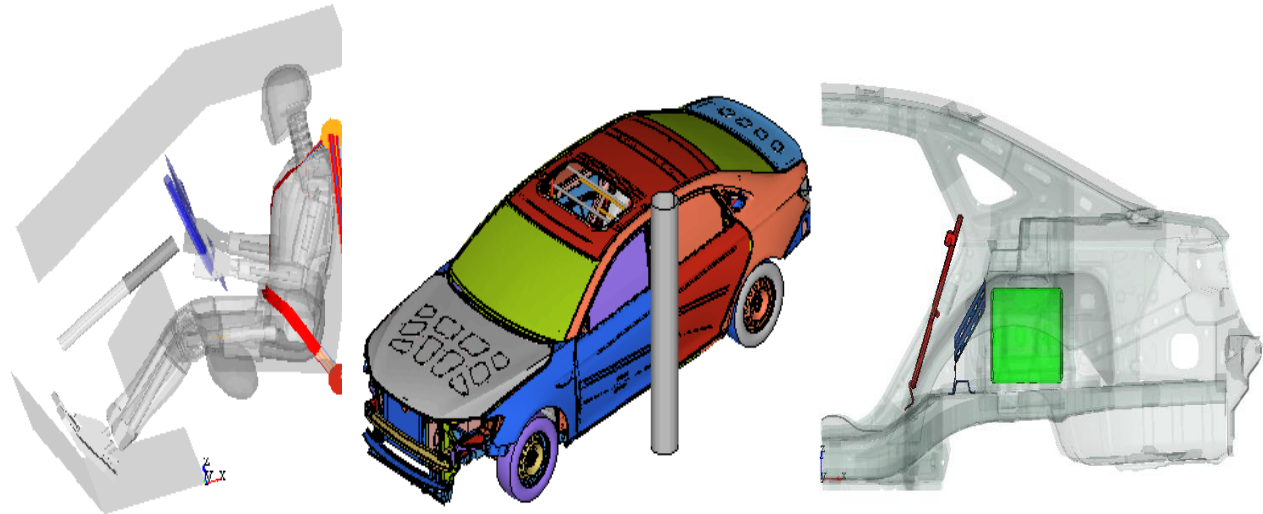
1. 乘员保护
2. 整车碰撞

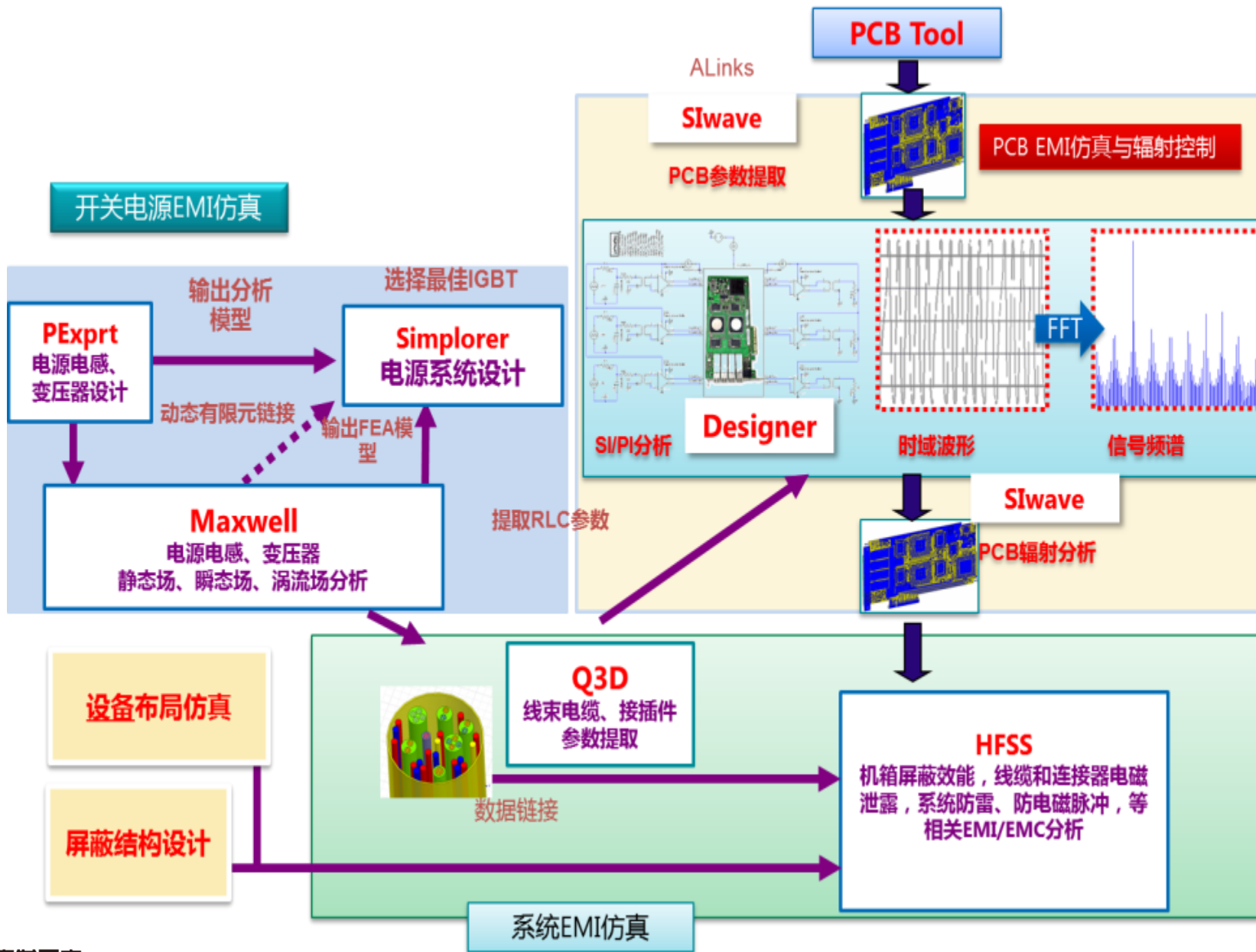


B柱下方加速度曲线

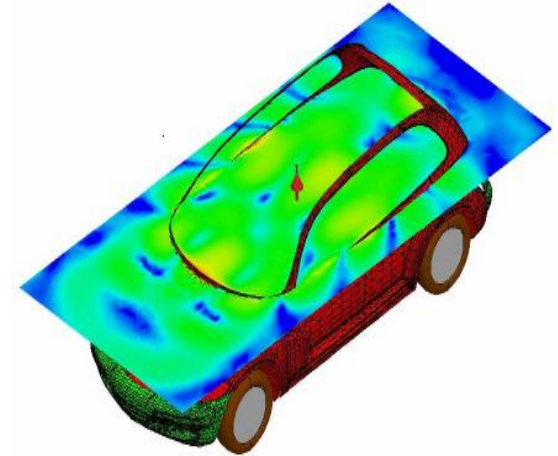
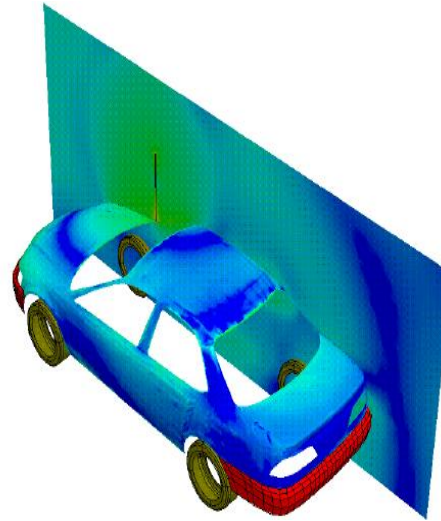
Solution

- ANSYS LS DYNA
- ANSYS LS DYNA HPC



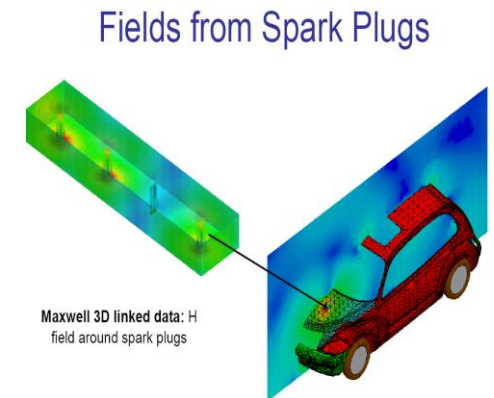
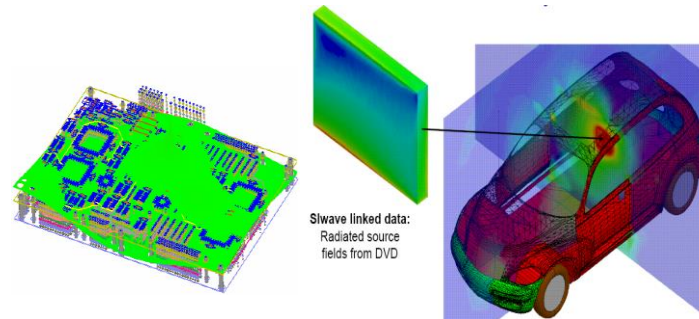


1. 信号完整性
2. 电磁兼容性
3. 天线布局



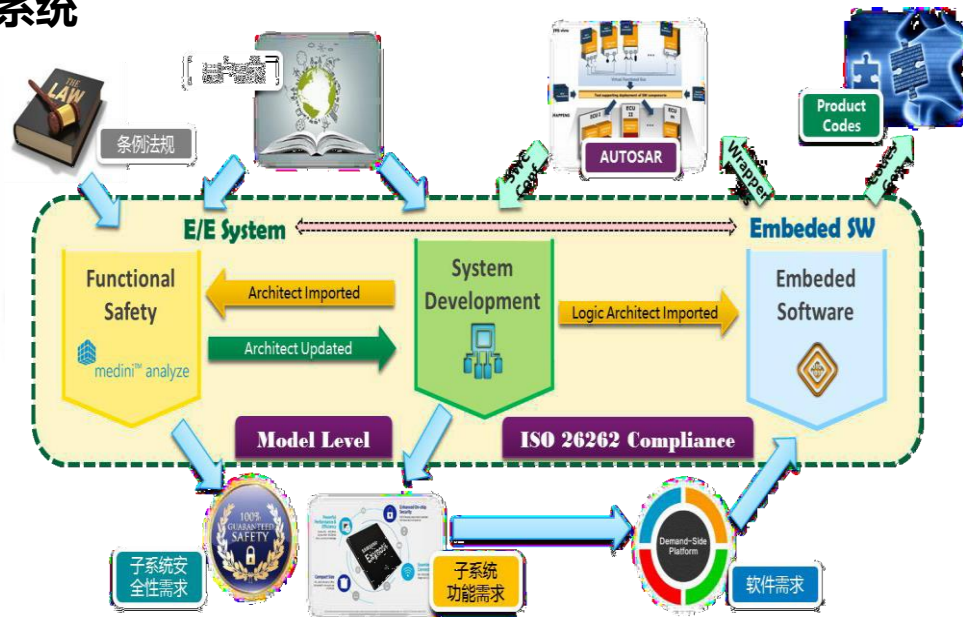
Solution

- ANSYS HFSS
- ANSYS Q3D
- ANSYS SIwave
- ANSYS SI Option
- ANSYS Electronics HPC



越来越多的电子电器系统将成为强安全相关的系统

- 整车控制器（新能源）
 - 电池管理系统（新能源）
 - 电机控制器（新能源）
 - ESP/ESC（车身稳定控制系统）
 - LDWS（车道偏离预警系统）
 - CCAS（汽车防撞雷达系统）
 - SRS（安全气囊）
 - EMS/CATS（自适应悬架控制）
 - EBS（电子制动系统）
 - ASR（牵引力控制系统）
 - BAS（制动辅助系统）
 - EBD（电子制动力分配系统）
 - EBA（紧急制动辅助系统）
 - ACC（自动巡航系统）
 - BCM（车身控制系统）
- More and more.....*



越来越多的国际知名品牌车企对于电子电气部件的采购已经明确提出了新的要求：
部件需要符合ISO26262标准并获得独立的第三方认证



谢谢

