Master advanced technology to improve automotive components

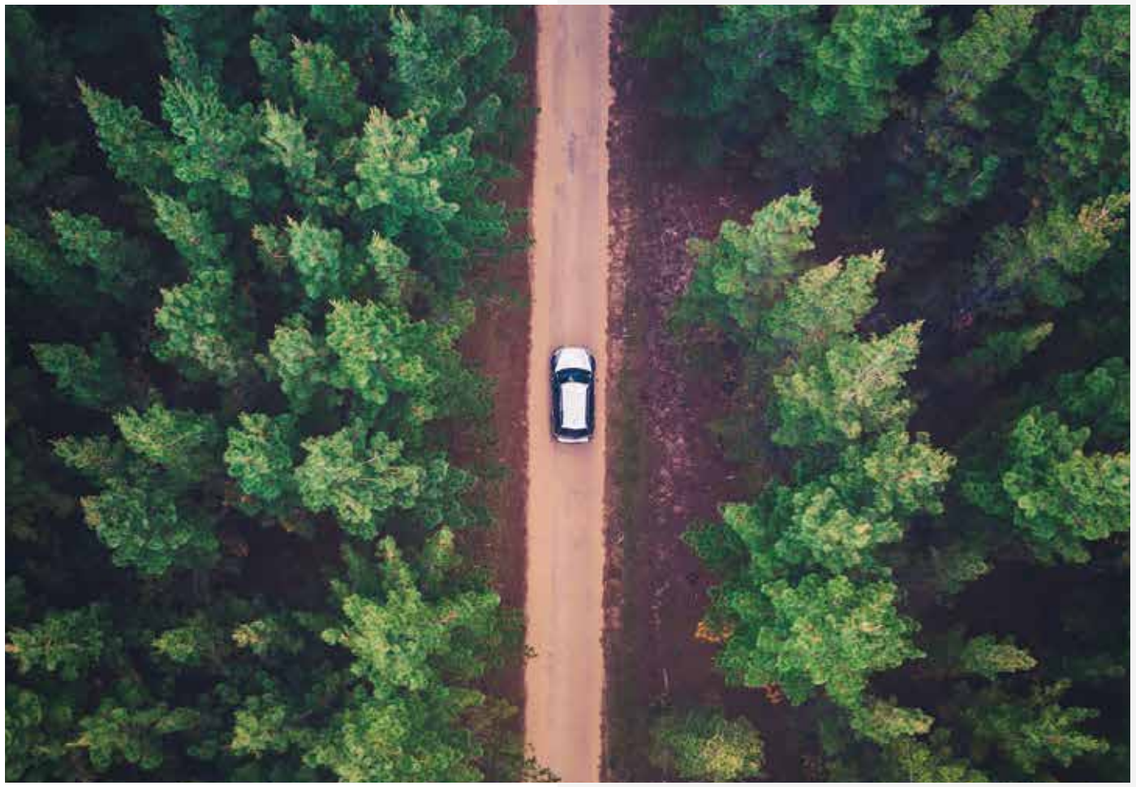
BAOLONG

让更多人受益于汽车科技的发展

DEVELOP AUTOMOTIVE TECHNOLOGY FOR THE BENEFIT OF MORE PEOPLE

INTELLIGENT
PERCEPTION
OF THE
FUTURE

Our Mission and Vision
我们的使命和愿景



“

掌握领先技术，提升汽车部件。

Master advanced technology to improve automotive components

让更多人受益于汽车科技的发展。

Develop automotive technology for the benefit of more people

About Baolong Automotive

关于保隆科技

保隆科技于1997年5月在松江创立，于2017年在上海证券交易所上市（股票代码：603197）。公司总部位于上海市松江区，在上海松江、上海浦东、安徽宁国、安徽合肥、湖北武汉和美国、德国、波兰、匈牙利、奥地利等地有生产基地以及研发和销售分支机构，全球员工超过6600人。

保隆科技立足汽车制造业，向汽车智能化与轻量化方向发展。公司产品包括气门嘴、平衡块、智能空气悬架等橡胶金属部件；排气系统管件、汽车结构件和EGR管件等汽车金属管件；汽车胎压监测系统、汽车传感器、基于摄像头和毫米波雷达等技术的汽车驾驶辅助系统等汽车电子产品。

保隆科技是宝马、奔驰、奥迪、大众、丰田、通用、一汽、东风、长安、长城、奇瑞、吉利、比亚迪、蔚来、小鹏、理想、零跑等知名汽车厂的合格供应商。公司以“让更多人受益于汽车科技的发展”为愿景，以“掌握领先技术，提升汽车部件”为使命，在汽车零部件领域作纵深发展。

Shanghai Baolong Automotive Corporation (hereinafter referred to as "Baolong") was founded in 1997, and is listed on Shanghai Stock Exchange (603197.SH). Headquartered in Songjiang District, Shanghai, Baolong has manufacturing sites, R&D and sales centers in China (Songjiang District and Pudong district, Shanghai; Ningguo and Hefei, Anhui Province; Wuhan, Hubei Province), the United States, Germany, Poland, Hungary, Austria, etc., and 6,600 staff around the world.

Baolong has implemented the “Intelligent & Lightweight” strategy to illustrate its continuous innovation in automotive solutions. Its products include rubber & metal parts such as tire valves, wheel weights, ECAS; metal tubing such as exhaust pipes, structural parts and EGR pipes; and automotive electronics featured by TPMS, sensors, and drive assistance systems based on cameras and millimeter-wave radars.

Adhering to the vision of “letting more people benefit from the development of automotive technology”, and taking "mastering advanced technology to improve automotive components" as its mission, Baolong is a qualified supplier of BMW, Mercedes Benz, Audi, Volkswagen, Toyota, General Motors, FAW, Dongfeng, Changan, Great Wall, Chery, Geely, BYD, NIO, Xpeng, Ideal, Leapmotor, etc.

Customer Base
主要客户

自主品牌
Chinese Brands

造车新势力
Start-Ups

外资品牌
International Brands

保隆科技与许多世界知名的整车厂和一级供应商合作，他们相信保隆科技致力于汽车产品和解决方案的创新和改变，使得驾乘人员能够获得更安全、更有效率和更舒适的体验。

Baolong cooperates with many world-renowned OEMs and Tier 1 suppliers that trust us to implement the most innovative and game-changing products and solutions to improve safety, efficiency and comfort.

一级供应商
Tier-1 Suppliers

售后客户
Aftermarket

注：以客户英文名称首字母的先后顺序排列（In alphabetical order of English name）

Global Footprint
全球布局

27 年历史

1997年5月20日，创立于上海松江

Founded in Songjiang,
Shanghai on May 20, 1997

6600+ 人

截至2023年12月31日，全球员工总数超过6600人

More than 6,600 employees globally
as of Dec. 31, 2023

9 个生产园区

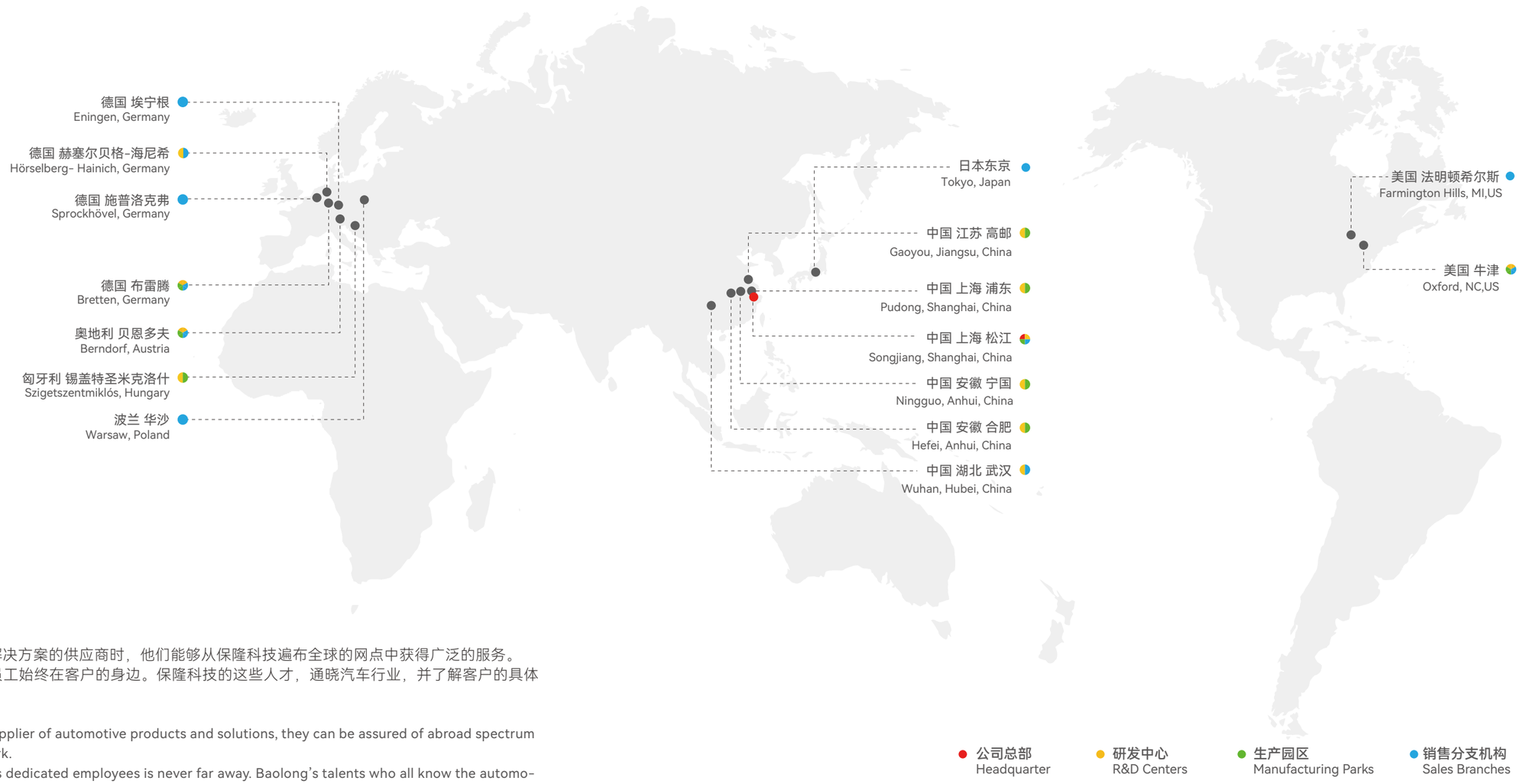
在中国、北美、欧洲，设有9个生产园区

Nine manufacturing parks in China,
North America and Europe

2000+ 个客户

向全球50多个国家和地区的2000多个客户提供产品和服务

Supplies to more than 2,000 customers
in over 50 countries and regions



当客户选择保隆科技作为汽车产品和解决方案的供应商时，他们能够从保隆科技遍布全球的网点中获得广泛的服务。在全球范围内，我们保隆科技敬业的员工始终在客户的身边。保隆科技的这些人才，通晓汽车行业，并了解客户的具体需求，能够随时为客户提供各种支持。

When customers choose Baolong as a supplier of automotive products and solutions, they can be assured of abroad spectrum of services from Baolong's global network.
Globally present, the access to Baolong's dedicated employees is never far away. Baolong's talents who all know the automotive industry and understand customers' specific demands and needs are always ready to support customers.

Milestones
发展历程

1997
公司成立
Baolong founded

1998
研制轮胎气门嘴
Developed tire valves

1999
总部园区成立
Songjiang (China) factory opened

2000
研制车轮平衡块
Developed wheel weights

2001
研制排气系统管件
Developed exhaust pipes

2002
研制TPMS
Developed TPMS

2005
收购美国DILL公司
Acquired Dill Air Controls Products, LLC

2006
宁国园区成立
Ningguo (China) factory opened

2009
研制汽车压力传感器
Developed pressure sensors

2012
研制汽车结构件、光学传感器、空气弹簧
Developed structural parts, optical sensors, and air springs

2013
研制视觉系统、毫米波雷达
Developed cameras and millimeter-wave radars

2014
武汉园区成立
Set up R&D center in Wuhan, China

2016
研制电控减振器
Developed air spring dampers

2017
上海证券交易所上市
IPO on Shanghai Stock Exchange

2018
合肥园区成立
收购德国PEX和TESONA
研制ECAS

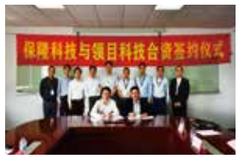
Hefei (China) factory founded
Acquired PEX, TESONA
Developed ECAS

2019
保富电子正式运营
保隆沙士基达成立
收购奥地利MMS

BH SENS established
BSHF founded
Acquired MMS, Austria

2020
与领目科技合资
武汉园区新办公楼启用
量产双目视觉系统

JV with Leadmove
Wuhan R&D building opened
Mass produced stereo cameras



2021
SAP上线
空气悬架新品量产
合肥园区启用

Introduced ERP system from SAP
Batch production of air suspension
Hefei (China) factory opened

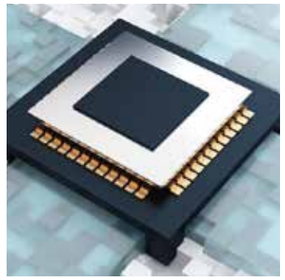
2022
收购龙感科技
与苏州优达斯合资
与元橡科技合资
全铝空悬储气罐量产下线
成立迈艾斯上海

Acquired Longgan
JV with UDAS
JV with METOAK
Mass produced all-aluminum air tanks for air suspension
MMS (Shanghai) founded

2023
欧洲研发制造中心正式开园
安徽宁国两个新厂区启用&项目投产
悬架控制器在合肥园区量产下线

European R&D and manufacturing center opened in Hungary;
Two new factories in Ningguo opened and started production;
Mass produced air suspension controllers in Hefei factory

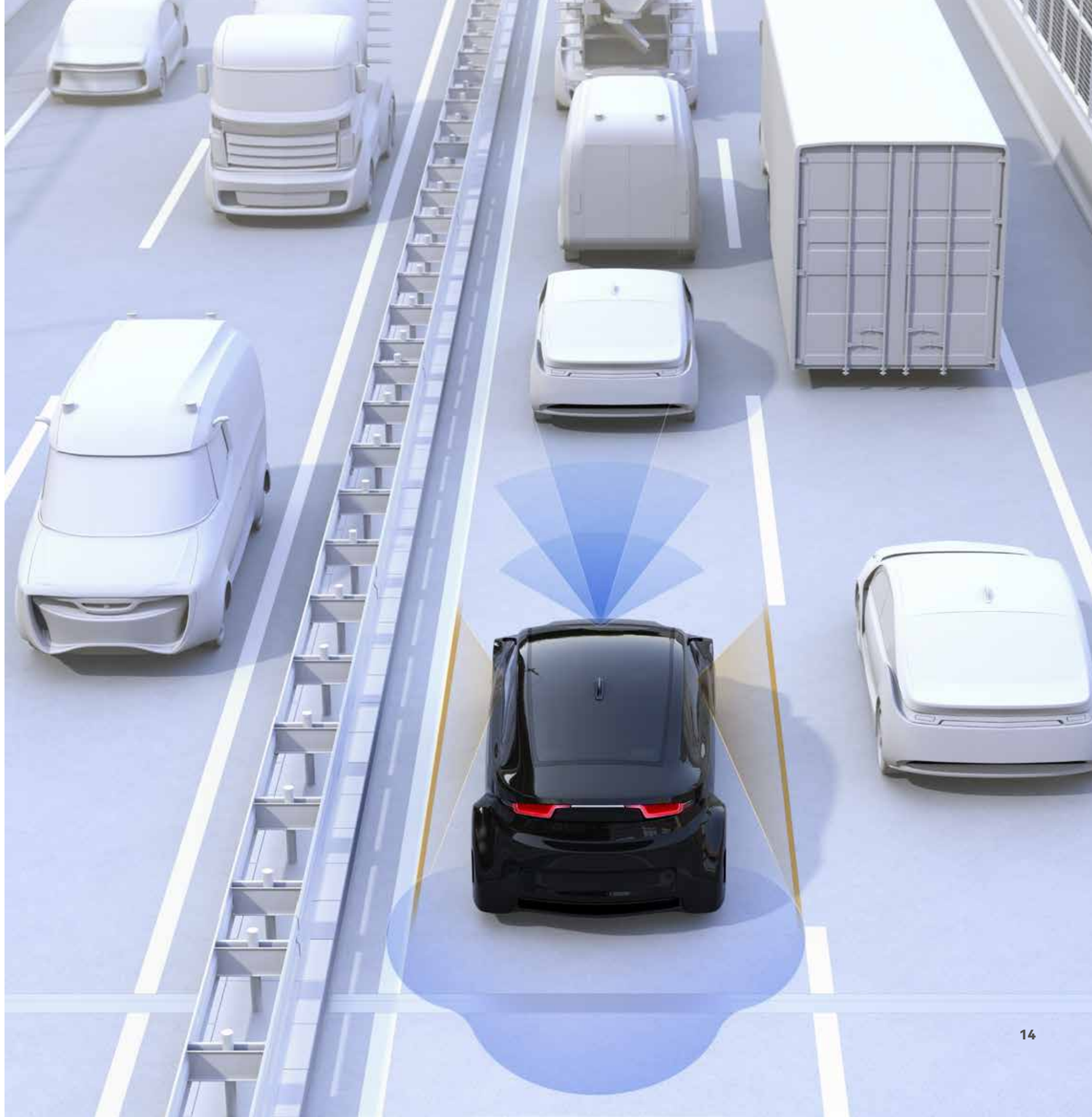
Contents
目录



01

CAMERAS

/摄像头/



AROUND VIEW MONITORING CAMERA

环视摄像头

环视摄像头安装在车身之前、后、左、右的超广角摄像头；实时采集车辆周围的影像，经过对四个摄像头采集到的原始图像进行矫正、视角变换、拼接后，形成一幅360°全景鸟瞰图画面；并实时传送至位于车载导航显示器上显示。驾驶员通过显示器画面即可轻松观察到车辆所处位置以及车辆周围的情况，从容操控车辆泊车入位、避开障碍物或通过复杂路面，有效减少刮蹭、碰撞、陷落等事故的发生。

The AVM camera is a kind of ultra-wide-angled camera mounted on the front, rear, left and right of the vehicle. After correction, visual angle change, and stitching of the original images collected by the four cameras, a 360° panoramic aerial view is created and transmitted to the navigation displayer in real time, so that the driver can easily observe the position and surroundings of the vehicle, which makes parking, avoidance of obstacles and passing complex road more easily, and scratching, collision, collapse, etc. can be reduced.

应用场景 / Application Scenarios

100万环视摄像头

1-million-pixel AVM Camera

产品参数 / Product Parameters

工作电压 / Operating Voltage	7~16V
工作温度 / Operating Temperature	-40℃ ~ +85℃
存储温度 / Storage Temperature	-40℃ ~ +5℃
传感器 / Sensor	CMOS
光学格式 / Optical Format	1/3.55inch 1/3.7 inch
像素尺寸 / Pixel Size	3μm
光圈 / Aperture	F2.0
分辨率 / Resolution	1280×720 / 1280×800 / 1280×960
帧率 / Frame Rate	25fps 30fps
清晰度 / Definition	中央区域 / Central Area ≥600TV Line，边沿区域 / Edge Area ≥500TV Line
视场角 / FOV	HFOV=197° VFOV= 152°@960P HFOV =197° VFOV= 120°@720P HFOV=195° VFOV= 151°@960P HFOV =195° VFOV= 129°@720P HFOV =125° VFOV= 102°@960P HFOV =125° VFOV= 82.5°@720P HFOV=139° VFOV= 109°@960P HFOV =139° VFOV= 86.5°@720P
信噪比 / SNR	42dB / 43dB
动态范围 / Dynamic Range	120dB
低照度 / Low Lux	0.1Lux
输出信号 / Output Signal	LVDS POC
动态白平衡 / Dynamic White Balance	支持 / Yes
红外滤波 / Infrared Filtering	支持 / Yes
透镜结构 / Lens Structure	2G3P+IR
工艺 / Technology	AA工艺 激光焊接/ AA Technology Laser welding
防水 / IP Grade	前端 / Front IP69K，后端 / Rear IP67
国产化率 /Local IC Rate	> 70% / More Than 70%

200万高清环视摄像头

2-million-pixel AVM Camera

产品参数 / Product Parameters

工作电压 / Operating Voltage	7~16V
工作温度 / Operating Temperature	-40℃ ~ +85℃
存储温度 / Storage Temperature	-40℃ ~ +95℃
传感器 / Sensor	CMOS
光学格式 / Optical Format	1/2.42inch　1/2.44inch
像素尺寸 / Pixel Size	3μm
光圈 / Aperture	F2.0
分辨率 / Resolution	1920×1080
帧率 / Frame Rate	30fps / 45fps / 60fps
清晰度 / Definition	中央区域 / Central Area ≥800TVLine，边沿区域 / Edge Area ≥600TVLine
视场角 / FOV	HFOV=195° VFOV=112°@1920×1080 环视 / Around View
信噪比 / SNR	42dB
动态范围 / Dynamic Range	120dB
低照度 / Low Lux	0.1Lux
输出信号 / Output Signal	LVDS POC / LVDS POC
动态白平衡 / Dynamic White Balance	支持 / Yes
红外滤波 / Infrared Filtering	支持 / Yes
透镜结构 / Lens Structure	2G4P+IR
工艺 / Technology	AA工艺　激光焊接 / AA Technology Laser A、Welding
防水 / IP Grade	前端 / Front IP69K，后端 / Rear IP67

300万环视摄像头

3-million-pixel AVM Camera

产品参数 / Product Parameters

工作电压 / Operating Voltage	7~16V
工作温度 / Operating Temperature	-40℃ ~ +85℃
存储温度 / Storage Temperature	-40℃ ~ +95℃
传感器 / Sensor	CMOS
光学格式 / Optical Format	1/2.42inch　1/2.44inch
像素尺寸 / Pixel Size	3μm
光圈 / Aperture	F2.0
分辨率 / Resolution	1920×1536
帧率 / Frame Rate	30fps / 45fps / 60fps
清晰度 / Definition	中央区域 / Central Area ≥800TVLine，边沿区域 / Edge Area ≥600TVLine
视场角 / FOV	HFOV=195° VFOV=154°@1920×1536 环视 / Around View
信噪比 / SNR	42dB
动态范围 / Dynamic Range	120dB
低照度 / Low Lux	0.1Lux
输出信号 / Output Signal	LVDS POC / LVDS POC
动态白平衡 / Dynamic White Balance	支持 / Yes
红外滤波 / Infrared Filtering	支持 / Yes
透镜结构 / Lens Structure	2G4P+IR
工艺 / Technology	AA工艺　激光焊接 / AA Technology Laser Welding
防水 / IP Grade	前端 / Front IP69K，后端 / Rear IP67

FRONT VIEW CAMERA

前视摄像头

前视摄像头可实现对车辆前方视觉感知，可根据不同应用场景选用30度、60度和120度镜头视场角，感知前方远距离的物体。与整车的雷达配合，感知路况，消除盲区，能够帮助车辆更好地识别高速移动的物体。同时，项目将继续自研创新800万像素小型化产品，以24*24mm的小巧尺寸设计可以适应更多安装位置，满足客户对低成本化和小型化的需求。助力智能驾驶的应用。

The front view camera focuses on the front views of the vehicle. Lens field of view has options of 30°, 60°, and 120 °for different application scenarios. Integrated with radar, it can perceive road conditions and eliminate blind spots, so that the vehicle can better recognize high-speed moving objects and it has good performance at night. The company will continue to self-develop and innovate on 8 -million-pixel cameras with a small size of 24*24mm, which are compatible with more installation positions, meeting the customer's demand for low cost and small size.

应用场景 / Application Scenarios

一般用于分离式一体机或域控，结合算法或与毫米波雷达融合，可以实现大多数前向智能驾驶的功能：

Usually used for separated all-in-one machine or domain controller. Combined with algorithms or fusion with millimeter wave radar, most functions of intelligent driving in respective of front views can be realized:

盲区监测 ICC

自适应巡航 ACC

车道保持辅助 LKA

行人自主紧急制动 PAEB

交通拥堵辅助 TJA

车道偏离预警 LDW

前向碰撞预警 FCW

智能大灯 IHC

交通标志识别 TSR

200万前视摄像头

2-million-pixel Front View Camera

输入电压 / Input Voltage	DC 9-16V
消耗电流 / Current Consumption	<200mA
工作温度范围 / Temperature	-40 ~ +85 ℃
存储温度范围 / Storage Temperature	-40 ~ +105℃
图像输出分辨率 / Output Resolution	1080p
光学格式 / Optical Format	1/2.7英寸/ Inch
动态范围 / Dynamic Range	120 dB @WDR
无频闪模式 / Flicker-free Mode	50Hz 无频闪模式/ Flicker-free Mode
启动时间 / Start Time	< 500ms
最小物体的照明 / Illumination of The Smallest Object	> 1lux
数据输出接口 / Output Interface	FAKRA Z
视角 / Angle of View	H：94.6°，V：52.8°（短距 / Short Range） H:56°, V:30.6°（中距 / Medium Range） H:28°, V:15.9°（长距 / Long Range）
镜头通光 / F.NO	1.7(短距 / Short Range) 1.6(中距 / Medium Range) 1.6(长距 / Long Range)
尺寸 / Size	26x19x41

800万前视摄像头

8-million-pixel Front View Camera

输入电压 / Input Voltage	DC 9-16V
消耗电流 / Current Consumption	<200mA
工作温度范围 / Temperature	-40 ~ +85 ℃
存储温度范围 / Storage Temperature	-40 ~ +105℃
图像输出分辨率 / Output Resolution	4K
光学格式 / Optical Format	1/1.73英寸/ Inch
动态范围 / Dynamic Range	120dB
无频闪模式 / Flicker-free Mode	50Hz 无频闪模式 / Flicker-free Mode
启动时间 / Start Time	< 500ms
最小物体的照明 / Illumination of The Smallest Object	> 1lux
数据输出接口 / Output Interface	LVDS POC
视角 / Angle of View	119.94 / 47.96
F编号 / F Number	1.8
镜片镀膜 / Lens Coating	防水涂料 / Waterproof

8M TRIFOCAL CAMERA
8M三目立体视觉

三目立体视觉模组实现多功能应用，两侧同质化图像传感器实现视差图输出，得到3D点云，远距离测量，完成立体视觉的检测，获得目标的深度信息，辅助车辆精准避障。中间设置广角高分辨率图像传感器，用于覆盖大范围前方场景，补足车辆盲区，对于近距离移动目标的跟踪、识别及避让起到重要作用，尤其是对近距离行人及非机动车辆的横穿场景，能够准确预判，避免事故或减少事故程度。

Three-dimensional vision module to achieve multi-functional applications, both sides of the homogenized image sensor to achieve parallax map output, to obtain 3D point cloud, remote measurement, complete stereo vision detection, obtain the depth of the target information, assist vehicles to accurately avoid obstacles. The wide-angle high-resolution image sensor is set in the middle, which is used to cover a large range of front scenes and make up for the blind area of the vehicle. It plays an important role in tracking, identification and avoidance of short-range moving targets, especially for the crossing scene of short-range pedestrians and non-motor vehicles, which can accurately predict and avoid accidents or reduce the degree of accidents.

应用场景 / Application Scenarios

一般用于分离式一体机或域控，结合算法或与毫米波雷达融合，可以实现大多数前向智能驾驶的功能：

Usually used for separated all-in-one machine or domain controller. Combined with algorithms or fusion with millimeter wave radar, most functions of intelligent driving in respective of front views can be realized:

盲区监测 ICC

自适应巡航 ACC

车道保持辅助 LKA

行人自主紧急制动 PAEB

交通拥堵辅助 TJA

车道偏离预警 LDW

前向碰撞预警 FCW

智能大灯 IHC

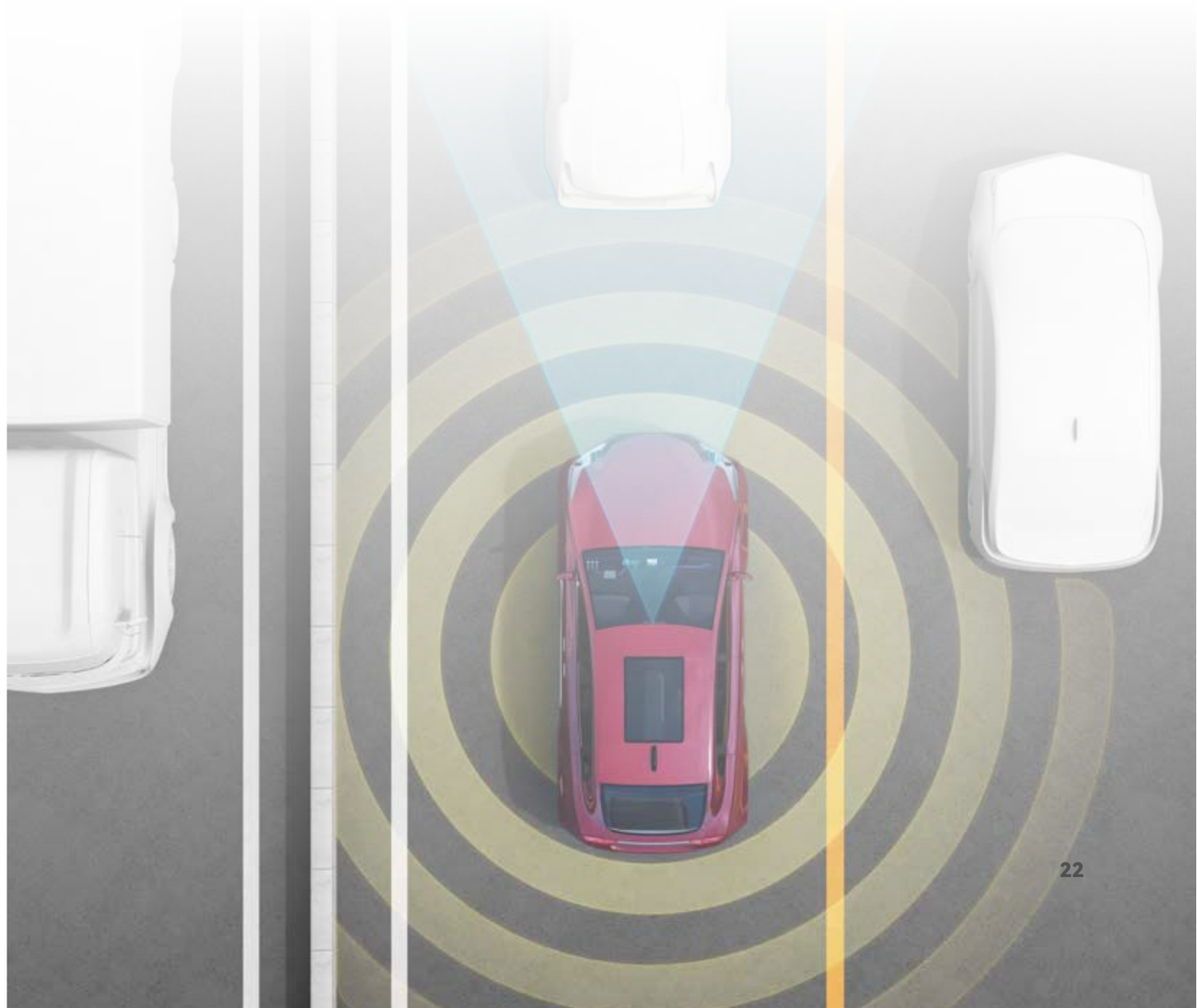
交通标志识别 TSR

产品参数 / Product Parameters

两侧摄像头 / Besides Cameras	中间摄像头 / Besides Cameras	摄像头输出像素 / Besides Cameras
HFOV：121.2°	VFOV：29.8°	3840*2160
VFOV：67.2°	DFOV：16.8°	
DFOV：140.1°	HFOV：34.2°	

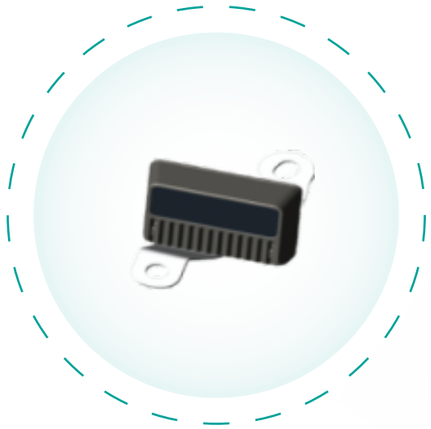
*FOV的大小根据功能需要，算法上可能会不同大小的裁切

*双目摄像头baesline:110mm（120°摄像头两侧，30°摄像头居中）



DRIVER MONITOR SYSTEM CAMERA

驾驶员监控DMS摄像头



基于数字高清技术，主要实现对驾驶员的身份识别、疲劳监测以及危险驾驶行为的监测功能，产品可针对多等级自动驾驶功能，在乘用车、商用车等不同领域的应用，设计不同的报警机制，并可对关键数据进行存储和上传云端，能够较好地提升智能驾驶安全等级，提高车辆行驶安全。

Based on digital high-definition technology, it's used for driver identification, fatigue monitoring and dangerous actions monitoring. The product can be used for self-drive of different levels for passenger vehicles, commercial vehicles, etc. Different alarm mechanisms can be designed, and key data can be stored and uploaded to the cloud.

应用场景 / Application Scenarios

结合DMS系统算法，可以实现 / Combined with DMS system algorithm, it can achieve:

- 人脸识别 Face Identification
- 疲劳与瞌睡监测 Fatigue and Sleepiness Monitoring
- 注意力不集中测 Inattention Monitoring
- 打电话监测 Phone Call Monitoring
- 吸烟监测 Smoking Monitoring
- 喝水监测 Drinking Monitoring
- 长时间驾驶监测 Long Driving Monitoring
- 视线跟踪 Eye Tracking
- 手势识别 Gesture Recognition
- OMS 生物遗留 Occupancy Detection
- 睡意分级(欧盟强标) Level of Sleepiness (EU Standard)
- 镜头遮挡 Lens Sheltered

产品参数 / Product Parameters

	1M DMS Camera	2M DMS Camera
信号类型 / Signal Type	LVDS	LVDS
接插件 / Connector	Fakra	Fakra
输出分辨率 / Output Resolution	1280x800	1600x1300
帧率 / Frame Rate	30fps	30fps
动态范围 / Dynamic Range	68dB	68dB
视场角 / FOV	HFOV：50 ~ 60°，VFOV：35 ~ 40°	HFOV： 50 ~ 60°,VFOV：35 ~ 40°
视频信号稳定时间 / Video Signal Stabilization Time	<300ms	<300ms
信噪比 / SNR	37.4dB	37.4dB
ISP	是 / Yes	是 / Yes
快门类型 / Shutter	Global Shutter	Global Shutter
传感器 / Sensor	IR	IR
波长 / Wave Length	940nm	940nm
发射角 / Launching Angle	25°（半角 / Semi-angle）	25°（半角 / Semi-angle）
工作电压 / Operating Voltage	9-16V（12V额定 / Rated）	9-16V（12V额定 / Rated）
工作电流 / Operating Current	<200mA	<200mA
功耗 / Power Consumption	<6W	<6W
供电方式 / Power Supply	PoC	PoC
工作温度 / Operating Temperature	-40℃ ~ 85℃	-40℃ ~ 85℃
存储温度 / Storage Temperature	-40℃ ~ 95℃	-40℃ ~ 95℃
保护等级 / Protect Grade	IP5K2	IP5K2
安装位置 / Mounting Position	左A柱 /方向盘管柱（无遮挡） Left A-pillar / steering Wheel String (Unsheltered)	左A柱/方向盘管柱（无遮挡） Left A-pillar / steering Wheel String (Unsheltered)

OCCUPANCY MONITORING SYSTEM CAMERA

乘客监控OMS摄像头

实时采集车舱内部状态图像，通过分析用于提供儿童监控、生命体征监测、乘客位置状态等监控功能，另外可以进行遗留物监测提醒车主，以及物体识别与人车交互系统（手势控制）等功能。

By real-time acquisition and analysis of images of the cabin, it can provide child monitoring, vital signs monitoring, passenger position monitoring, and occupancy monitoring to alert the driver. It also supports object recognition and human-vehicle interaction system (gesture control).

应用场景 / Application Scenarios

结合控制器算法可实现 / Combined with the controller algorithm, it can achieve:

- 乘客行为识别 Passenger Behavior Recognition
- 遗留物体监控 Left Object Monitoring
- 宠物及活体监控 Living Body Detection
- 手势识别 Gesture Recognition

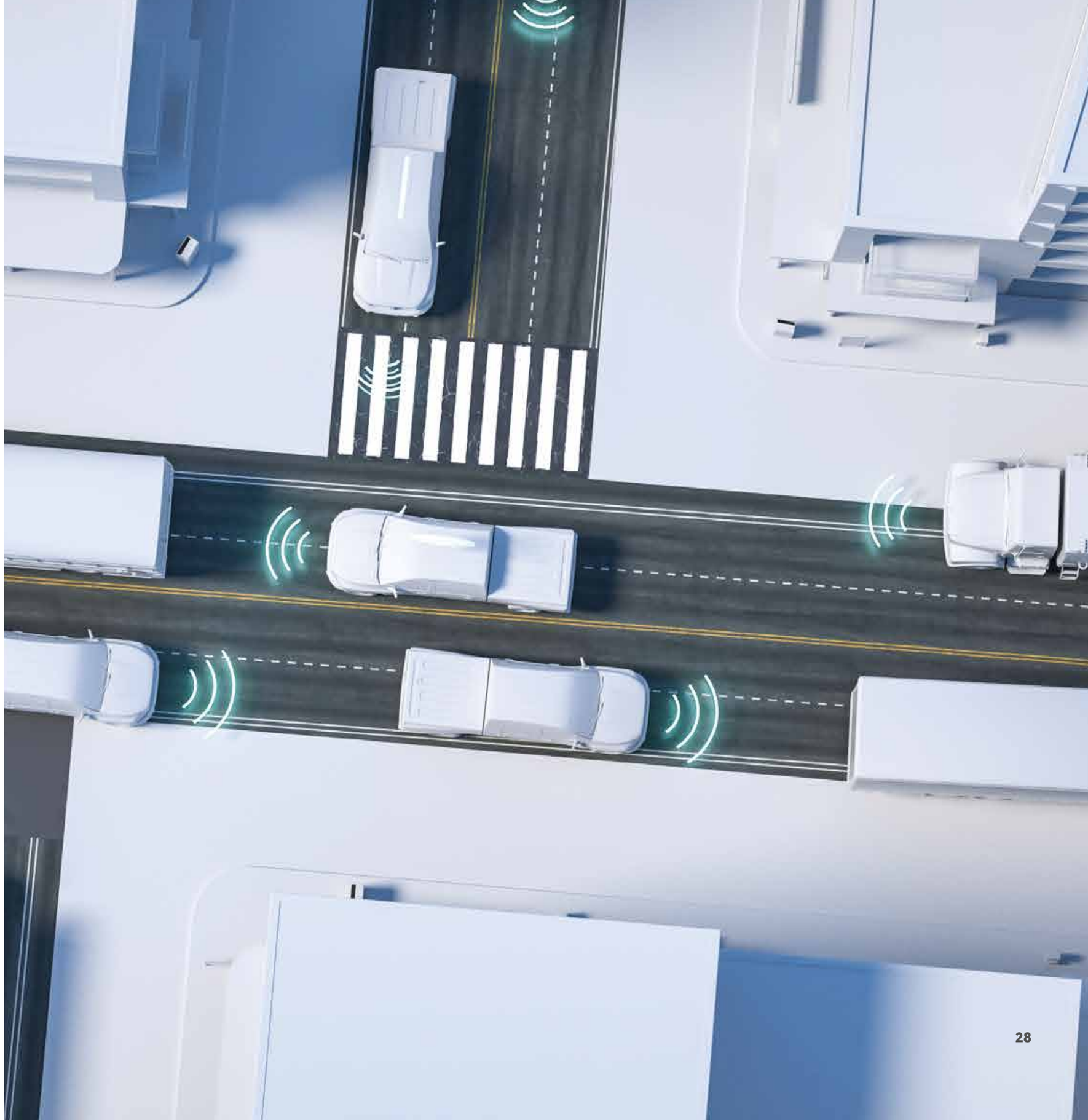
产品参数 / Product Parameters

传感器类型 / Sensor Type	1/2.9 Inch CMOS
像素尺寸 / Pixel Size	2.8 um
有效像素 / Effective Pixels	1920(H)×1080(V)
输出信号 / Output Signal	up to 4-lane MIPI CSI-2/LVDS, 12-bit DVP
工作电压 / Operating Voltage	Range: DC 9V-16V
工作电流 / Operating Current	< 1A
工作温度 / Operating Temperature	-40℃~+85℃
存储温度 / Storage Temperature	-40℃~+95℃
镜头视野范围 / Lens Field of View	118.3°（H） 62.3°（V）
信噪比 / SNR	42.6dB
IR LED工作波长 / Operating Wavelength	940nm
启动时间 / Start Time	≤200mS
帧率 / Frame Rate	30 fps at 1080P
动态范围 / Dynamic Range	120dB
防护等级 / IP Grade	IP54
尺寸 / Size	长（Length）≤80，宽（Width）≤30，高（Height）≤19

02

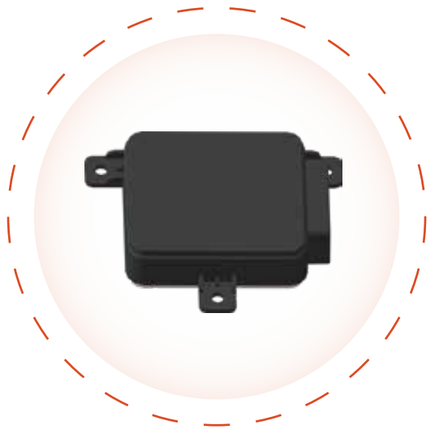
MILLIMETER -WAVE RADARS

/毫米波雷达/



IN-CABIN RADAR

舱内毫米波雷达



上海保隆汽车科技股份有限公司自研的舱内毫米波雷达，采用2发3收方案，体积小，低成本，低功耗，可实现活体探测，占位检测，防盗入侵检测。

With 2-transmitter & 3-receiver solution, the self-developed in cabin radar is small in size, having the advantage of low cost, low power consumption. And this radar could support living body detection, seat occupancy detection, intruder detection.

应用场景 / Application Scenarios

活体检测
Living Body Detection

占位检测
Occupancy Detection

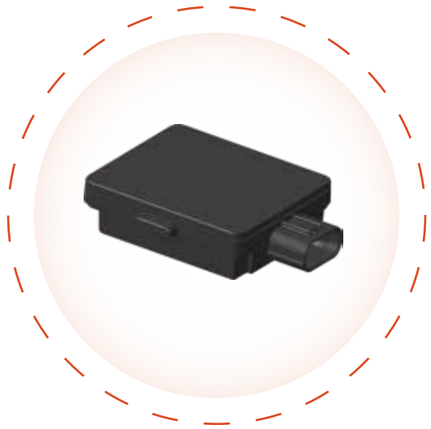
入侵检测
Intruder Detection

产品参数 / Product Parameters

频率 / Frequency	57GHz~64GHz
调制方式 / Modulation Mode	FMCW
收发 / Tx/Rx	2TX+3RX
带宽 / Operation Bandwidth	3GHz
检测距离 / Detection Range	2.8m
距离分辨率 / Range Resolution	0.05m
测距精度 / Range Precision	0.025m
角度范围 / Azimuth Angle Range	±60°（Horizontal）±60°（Vertical）
角度精度 / Azimuth Angle Precision	1°（Horizontal） 2°（Vertical）
速度范围 / Velocity Range	-3.11m/s~+3.11m/s
速度精度 / Velocity Precision	0.39m/s
通信接口 / Interface	CAN/CANFD/LIN
功耗 / Power Consumption	<1W （防盗入侵模式/Intruder mode<45mW）
防护等级 / IP Grade	IP52
重量 / Weight	50g
尺寸/ Size	69*55*15.5（mm）

FRONT MILLIMETER WAVE RADAR

前向毫米波雷达



前向毫米波雷达安装于车辆前方，采用远近距双模探测模式来探测雷达前方目标信息，主要应用于FCW / ACC / AEB系统，为车辆安全驾驶提供辅助作用。

Mounted on the front of the vehicle and adopting dual mode of both long-range and short range to detect forward information, it is mainly used in FCW / ACC / AEB systems, providing assistance for safe driving.

应用场景 / Application Scenarios

前方碰撞预警
FCW

自适应巡航控制
ACC

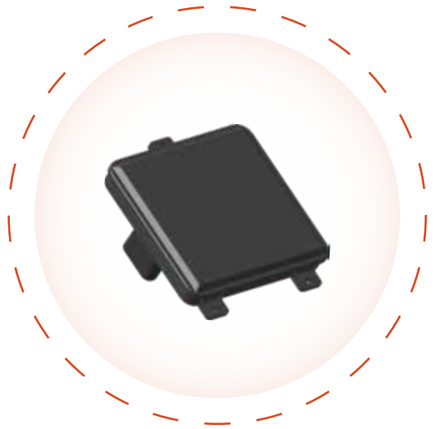
自动紧急制动
AEB

产品参数 / Product Parameters

频率 / Frequency	76GHz~77GHz
调制方式 / Modulation Mode	FMCW
收发 / Tx/Rx	4TX+4RX
带宽 / Operation Bandwidth	Long:340MHz ; Short:780MHz
周期 / Cycle	66ms
目标检测数量 / Number of Detectable Targets	64
工作电压 / Operating Voltage	9V~32V
功耗 / Power Consumption	<2.4W
检测距离 / Detection Range	Long:0.8m~250m; Short:0.3m~80m
测距精度 / Range Precision	Long:±0.25m; Short:±0.1m
距离分辨率 / Range Resolution	Long:0.8m; Short:0.3m
速度范围 / Speed Range	-400km/h~200km/h
速度精度 / Speed Precision	±0.03m/s
速度分辨率 / Speed Resolution	Long:0.12m/s; Short:0.10m/s
水平视场角 / Azimuth FOV	Long:±9°; Short:±60°
水平测角精度 / Azimuth Angle Precision	0.3°@0°
水平测角分辨率 / Azimuth Angle Resolution	Long:3.3°; Short:5.7°
垂直视场角 / Vertical FOV	±10°
垂直测角精度 / Vertical Angle Precision	0.5°@0°
防护等级 / IP Grade	IP69K
尺寸 / Size	90.2mm*74.5mm*20.8mm
重量 / Weight	<115g

FRONT 4D MILLIMETER WAVE RADAR

前向4D毫米波雷达



前向4D毫米波雷达安装于车辆前方，采用远近距双模探测模式来探测雷达前方目标信息，相比传统毫米波雷达可以实现更远的探测距离和测角精度、测角分辨率，具有俯仰向测角能力，高点云密度，可有效应用于FCW / ACC / AEB等高阶智驾系统功能，为车辆安全驾驶提供辅助作用。

4D radar is mounted on the front of the vehicle and adopting dual mode of both long-range and short range to detect forward information. Compared with traditional milimeter wave radar, 4D radar could support long detecting range, high level angle precision and resolution, vertical angle detecting ability and high density point cloud, which is mainly used in FCW / ACC / AEB high level ADAS fucntions, providing assistance for safe driving.

应用场景 / Application Scenarios

前方碰撞预警
FCW

自适应巡航控制
ACC

自动紧急制动
AEB

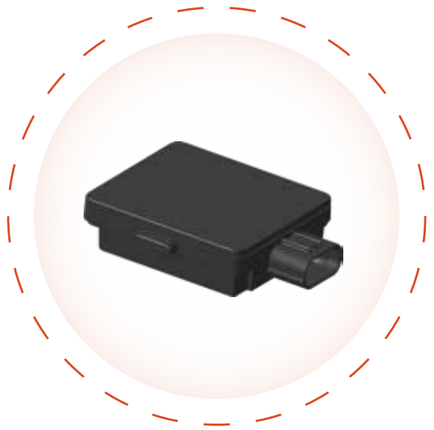
Cut In 场景
Cut In

产品参数 / Product Parameters

频率 / Frequency	76GHz~77GHz
调制方式 / Modulation Mode	FMCW
收发 / Tx/Rx	6TX+8RX
带宽 / Operation Bandwidth	Long:250MHz ; Short:600MHz
周期 / Cycle	66ms
目标检测数量 / Number of Detectable Targets	128
工作电压 / Operating Voltage	9V~32V
功耗 / Power Consumption	<6W
检测距离 / Detection Range	Long:0.6m~280m; Short:0.25m~120m
测距精度 / Range Precision	Long:0.3m; Short:0.1m
距离分辨率 / Range Resolution	Long:0.6m; Short:0.25m
速度范围 / Speed Range	-400km/h~200km/h
速度精度 / Speed Precision	0.06m/s
速度分辨率 / Speed Resolution	0.15m/s
水平视场角 / Azimuth FOV	±60°
水平测角精度 / Azimuth Angle Precision	0.1°@0°
水平测角分辨率 / Azimuth Angle Resolution	1.5°
垂直视场角 / Vertical FOV	±10°
垂直测角精度 / Vertical Angle Precision	0.5°@0°
垂直测角分辨率 /Vertical Angle Resolution	3°
防护等级 / IP Grade	IP69K
尺寸 / Size	111mm*100mm*15mm
重量 / Weight	<200g

CORNER RADAR

角毫米波雷达



角雷达通过发射电磁波、对回波信号的检测，反馈目标与雷达的相对距离、速度、角度，可在商用车、乘用车、工程车以及其他特殊车辆行驶过程中准确提示驾驶员盲区障碍物。集BSD、LCA、RCW、RCTA、 DOW、RCTB、FCTA、FCTB功能集于一体，同时可提供感知目标信息给域控用于高阶智驾功能，有效降低成本。

By emitting electromagnetic waves, and detecting the echo signal, the corner radar could tell the relative distance, speed and angle between the objects and itself, so that the driver can notice the obstacles in the blind area. It's applicable to commercial vehicles, passenger vehicles, off the road vehicles and other special vehicles. The corener radar integrates the function of BSD, LCA, RCW, RCTA, DOW, RCTB, FCTA, FCTB, and also could provide targets information for ADAS functions' application, which effectively reduces cost.

应用场景 / Application Scenarios

盲区监测 BSD

变道辅助 LCA

开门预警 DOW

后向碰撞预警 RCW

后方交通穿行提示/制动 RCTA/RCTB

前方交通穿行提示/制动 FCTA/FCTB

产品参数 / Product Parameters

频率 / Frequency	76GHz~77GHz
调制方式 / Modulation Mode	FMCW
收发 / Tx/Rx	4TX+4RX
带宽 / Operation Bandwidth	500MHz
周期 / Cycle	66ms
目标检测数量 / Number of Detectable Targets	64
工作电压 / Operating Voltage	9V~32V
功耗 / Power Consumption	<2.4W
检测距离 / Detection Range	0.2m~150m
测距精度 / Range Precision	0.1m
距离分辨率 / Range Resolution	0.4m
速度范围 / Speed Range	-300km/h~+300km/h
速度精度 / Speed Precision	0.05m/s
速度分辨率 / Speed Resolution	0.2m/s
水平视场角 / Azimuth FOV	±75°
水平测角精度 / Azimuth Angle Precision	0.4°@0°
水平测角分辨率 / Azimuth Angle Resolution	4°
垂直视场角 / Vertical FOV	±12°
垂直测角精度 / Vertical Angle Precision	0.5°@0°
防护等级 / IP Grade	IP69K
尺寸/ Size	90.2mm*74.5mm*20.8mm
重量/Weight	<115g

TRIANGLE RADAR
三角雷达

三角雷达能够实现车辆周边全方位盲区监测与报警提示，帮助驾驶员准确的判断实时路况，有效的降低事故发生率与出险率，大大提高了车辆行驶的安全性。
该系统具备以下的优势：
系统探测角度达到 180°，在车辆一侧安装可覆盖前后各 80m 的探测范围；仅需接入车速与变道指示等信号即可实现全功能表现；系统具有高度的开放性与灵活性，用户可以根据实际需求配置多种参数信息以适配多种车型。

The triangle radar can realize the omnidirectional blind area monitoring and alarm warning around the vehicle, help the driver accurately judge the real-time road conditions, effectively reduce the accident rate and risk rate, and greatly improve the safety of the vehicle.
The system offers the following advantages:
The detection Angle of the system can reach 180°, and the detection range of 80m before and after can be covered by the installation on one side of the vehicle; Only need to access the speed and lane change indication signals to achieve full functional performance; The system has a high degree of openness and flexibility, and users can configure a variety of parameter information according to the actual needs to adapt to a variety of vehicles.

应用场景 / Application Scenarios

盲区监测 BSD

变道辅助 LCA

开门预警 DOW

符合欧标 BSIS & MOIS

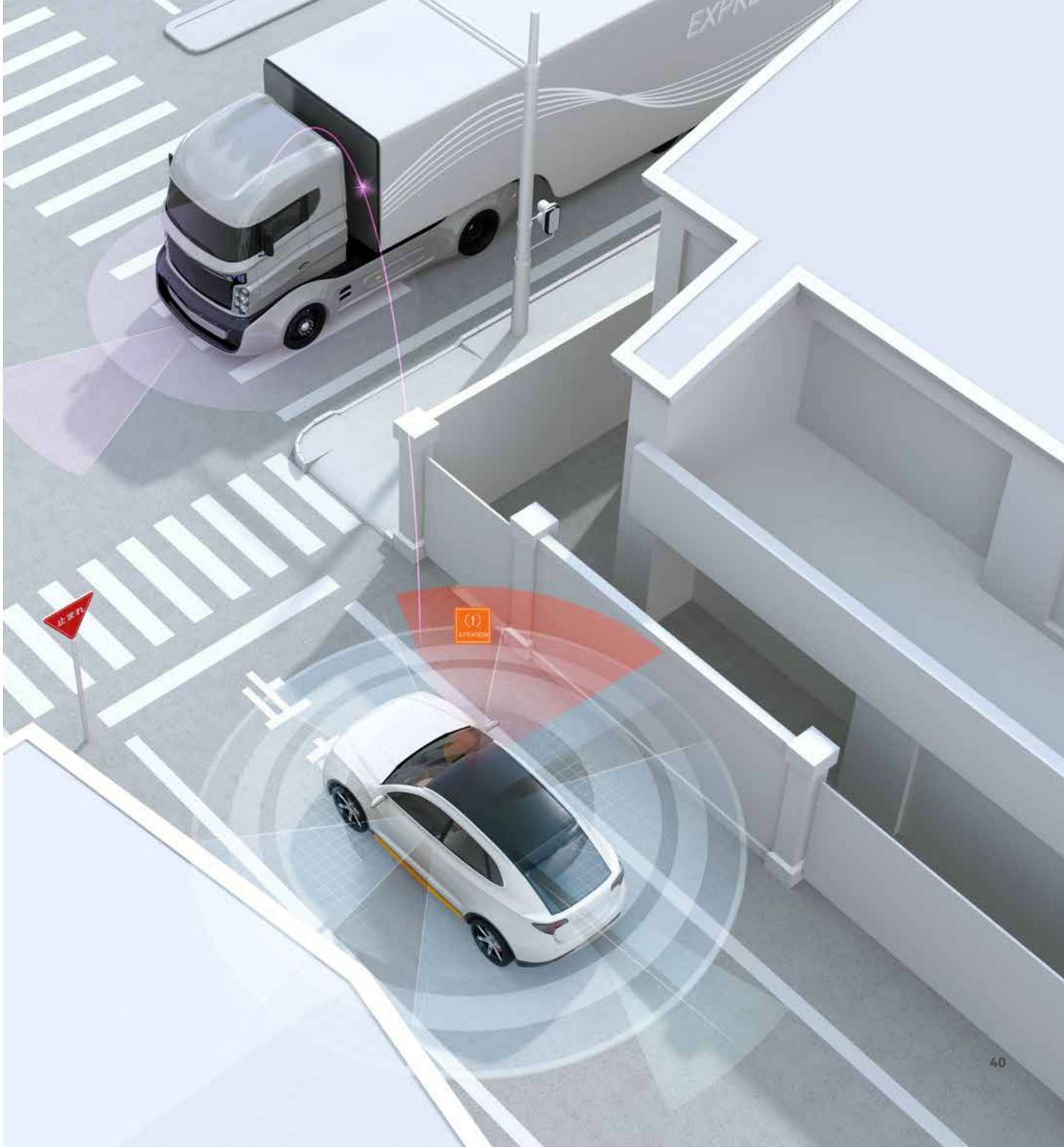
产品参数 / Product Parameters

频率 / Frequency	76GHz~77GHz
调制方式 / Modulation Mode	FMCW
带宽 / Operation Bandwidth	400MHz
周期 / Cycle	66ms
目标检测数量 / Number of Detectable Targets	128
工作电压 / Operating Voltage	9V~32V
工作电流 / Operating Current	<150mA(DC 24V)
静态电流测试 / IDDQ	<100uA
功耗 / TDP	<3.6W
检测距离 / Detection Range	0.4m~130m
测距精度 / Range Precision	0.1m
距离分辨率 / Range Resolution	0.4m
速度范围 / Speed Range	-200km/h~+200km/h
速度精度 / Speed Precision	0.05m/s
速度分辨率 / Speed Resolution	0.2m/s
水平视场角 / Azimuth FOV	±90°
水平测角精度 / Azimuth Angle Precision	1°
水平测角分辨率 / Azimuth Angle Resolution	7°
垂直视场角 / Vertical FOV	±10°
防护等级 / IP Grade	IP69K
尺寸/ Size	113.6mm×101mm×50.4mm
重量 / Weight	260g

03

ULTRASONIC RADARS

/超声波雷达/



ULTRASONIC RADAR

超声波雷达

超声波倒车雷达凭借穿透力强、衰减小、反射能力强，对光照、色彩、电磁场不敏感、不易受恶劣天气影响、测距原理简单、测距精度高、成本低等特点，已经逐渐成为乘用车的标准配置。ELS雷达安装在车辆的前后保险杠上，用于测量汽车前后障碍物的用于泊车辅助雷达，探测距离一般在15~150cm之间。

Ultrasonic reversing radar has become the standard configuration of passenger vehilces due to its strong penetration, small attenuation, strong reflection ability, insensitivity to light, color, electromagnetic field, insusceptibility to bad weather, simple ranging principle, high ranging accuracy, and low cost. ELS radar is installed on the front and rear bumpers of vehicles to detect the front and rear obstacles for parking assistance. Detection range is 15~150cm.

产品参数 / Product Parameters

工作电压 / Operating Voltage	12V（9~16V）
工作电流 / Operating Current	<10mA（平均 / Average），Max≤300mA
工作频率 / Frequency（kHz）	58±2
波束角 / Beam Angle	水平 / Horizontal：90~120deg， 垂直 / Vertical：45~60deg
最大探测范围 / Max Detection Range	1.5m(Φ75mm pole)
探测盲区 / Blind Area Detection Range	15cm， < 15cm时，可实现存在检知 / When it's < 15cm, Presence Can Be Detected
工作温度 / Operating Temperature	-40℃~85℃
工作湿度 / Operating Humidity	≤95%
防护等级 / IP Grade	IP67
信号类型 / Signal Type	数字式 /Digital
通信方式 / Communication Type	12V串行通信 LIN / 12V Serial Communication LIN
尺寸 / Size	44.5mm*27.1mm*20.9mm

应用场景 / Application Scenarios

泊车辅助
PAS

盲区监测
BSD

AUTO PARKIG ASSIST ULTRASONIC RADAR

自动泊车超声波雷达

UPA / APA 超声波雷达，安装在车辆的前后和侧面，IO通信接口的超声波雷达，一般前后各4个+侧面各2个，测量侧方障碍物距离，用于自动泊车。探测距离可以达到20~500cm之间，更远的探测距离让APA超声波雷达可以检测左右侧的障碍物，还能根据超声波雷达返回的数据判断停车库位或者路沿是否存在。另外UPA雷达一般也多用于泊车辅助系统

UPA/APA ultrasonic radar is mounted on the front, rear and sides of the vehicle. Usually twelve ultrasonic radars of IO communication interface are mounted, four on the front and rear respectively and two on the left and right side respectively, for detection of the distance of obstacles on sides to assist automated parking. The detection range is 20~500cm, allowing detection of obstacles on the left and right. It can also tell whether there is parking space or curb according to the data obtained. UPA ultrasonic radar is usually used for parking assistance, too.

产品参数 / Product Parameters

工作电压 / Operating Voltage	12V（9~16V）
工作电流 / Operating Current	<10mA（平均/ Average），max≤300mA
工作频率 / Frequency（kHz）	58±2
波束角 / Beam Angle	水平 / Horizontal：85deg, 垂直 / Vertical：35deg
最大探测范围 / Max Detection	UPA > 350cm；APA > 500cm
探测盲区 / Blind Area Detection Range	UPA 20cm; APA 25cm 区内可实现存在检知 / Within 25cm, Presence Can Be Detected
工作温度 / Operating Temperature	-40℃~85℃
工作湿度 / Operating Humidity	≤95%
防护等级 / IP Grade	IP67
信号类型 / Signal Type	数字式 / Digital
通信方式 / Communication Type	IO
尺寸 / Size	43.6mm*28.0mm*26.0mm

应用场景 / Application Scenarios

泊车辅助
PAS

自动泊车
APA

盲区监测
BSD

AK2 ULTRASONIC RADAR

AK2超声波雷达

DSI3通信的超声波雷达（AK2），一般安装于车辆前后位置各4个 + 侧面各2个，用于自动泊车、自动驾驶。AK2超声波雷达测距能力强，能够满足各类车型搭载智能泊车系统的障碍探测需求；兼备8K调频带宽，可同时发送和接收不同的声波信号，避免同频干扰；信号传播速度快，且能够同步处理多种回波特征值，支持多模式切换，满足智能驾驶迭代至L3、L4级对感知升级的要求。

Usually twelve ultrasonic radars (AK2) of DSI3 communication are mounted, four on the front and rear respectively, and two on the left and right side respectively, for automated parking and driving. With strong ranging ability, AK2 ultrasonic radar can meet the obstacle detection needs of various models equipped with intelligent parking system. Thanks to 8K FM bandwidth, it can send and receive different sound wave signals at the same time to avoid same-frequency interference. The signal transmission speed is fast, multiple echo feature values can be processed synchronously, and multi-mode switching is supported, meeting the perception upgrading requirements of intelligent drive iteration to L3 and L4.

产品参数 / Product Parameters

工作电压 / Operating Voltage	12V（9~16V）
工作电流 / Operating Current	<15mA（平均），Max≤550mA
工作频率 / Frequency（kHz）	58±2（可变频发波 / Variable Frequency Wave）
波束角 / Beam Angle	水平/Horizontal：85deg, 垂直/Vertical：35deg
最大探测范围 / Max Detection	> 500cm
探测盲区 / Blind Area Detection Range	15cm，< 15cm时，可实现存在检知 / When it's < 15cm, presence can be detected
工作温度 / Operating Temperature	-40℃~85℃
工作湿度 / Operating Humidity	≤95%
防护等级 / IP Grade	IP67
信号类型 / Signal Type	数字式 / Digital
通信方式 / Communication Type	DSI3
尺寸 / Size	43.6mm*28.0mm*26.0mm

应用场景 / Application Scenarios

泊车辅助 PAS

自动泊车 APA

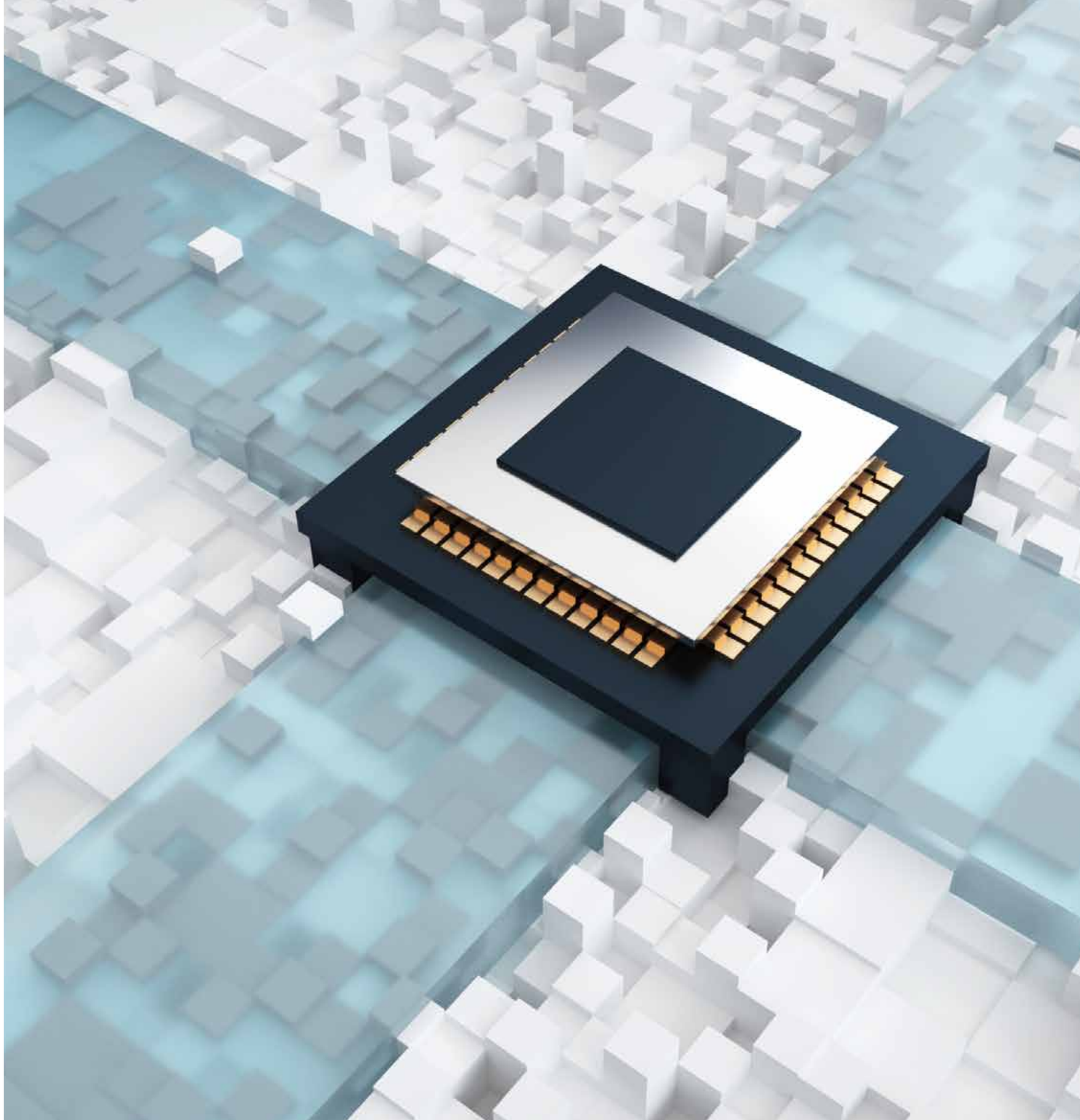
盲区监测 BSD

前方碰撞预警 FCW

04

SOLUTIONS

/解决方案/



AVM SYSTEM
360全景环视系统

360全景影像环视系统通过安装在车身前、后、左、右的四个超广角摄像头实时采集车辆周围影像，对图像进行矫正、视角变换和拼接处理后，形成一幅360°全景鸟瞰图画面，辅助驾驶员了解车辆周围盲区环境，从容操控车辆通过复杂路段，泊车入位，避开障碍物，有效减少刮蹭、碰撞、陷落等事故的发生。

The 360 panoramic image circumnavigation system collects images around the vehicle in real time through four ultra-wide-angle cameras installed in front, back, left and right of the vehicle body. After correcting, transforming and splicing the images, a 360° panoramic aerial view picture is formed, which assists the driver to understand the blind area environment around the vehicle, calmly control the vehicle through complex road sections, park and enter, and avoid obstacles. Effectively reduce the occurrence of scraping, collision, sinking and other accidents.

应用场景 / Application Scenarios

避开障碍物
Obstacles Avoidance

通过复杂路面
Complex Road Surface Passing

转弯避让
Swerve Avoidance

窄路会车
Narrow Road Meeting

产品参数 / Product Parameters

AVM Controller

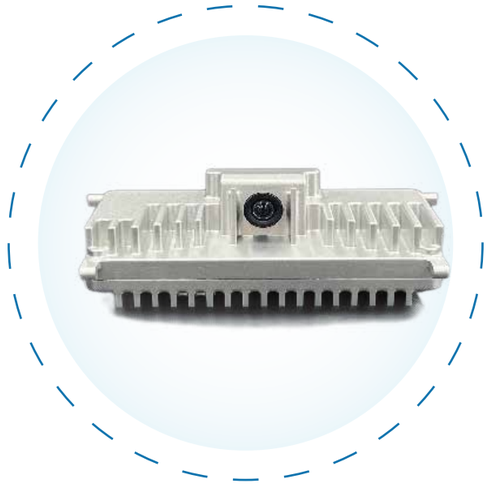
拼接视野 / Spliced Field Of View	540°全景 / 540 Degree Panoramic View
工作电压 / Operating Voltage	9V ~ 16V
工作电流 / Operating Current	1A @12V
工作温度范围 / Operating Temperature	-40℃ ~ +85℃
系统接口 / System Interface	硬连线(Hard-wired) / CAN
视频输入 / Video Input	LVDS （PoC）
视频输出 / Video Output	LVDS
输出像素 / Output Pixe	1280*720P/1920*1080P
输出帧率 / Output Framerate	≥30fps
图像延迟 / Image Delay	< 100ms
支持接入摄像头个数 /Number of cameras supported	最大支持接入6路1M摄像头/A maximum of six 1M cameras can be connected 最大支持接入4路3M摄像头/A maximum of six 3M cameras can be connected
冷启动/热启动时间 / Cold/Warm Start	< 7S / < 1S

1-million-pixel Camera

信号输出 / Signal Output	LVDS （PoC）
连接 / Connector	Fakra
工作电压 / Operating Voltage	7 ~ 16V
工作温度 / Operating Temperature	-40℃ ~ +85℃
防水等级 / IP Grade	前端 / Front IP69K、后端 / Rear IP67
分辨率 / Resolution	1280X720 1280X800 1280X960
信噪比 / SNR	42dB
动态范围 / Dynamic Range	120dB
低照度 / Low Lux	0.1Lux

MONOCULA CAMERA INTEGRATION

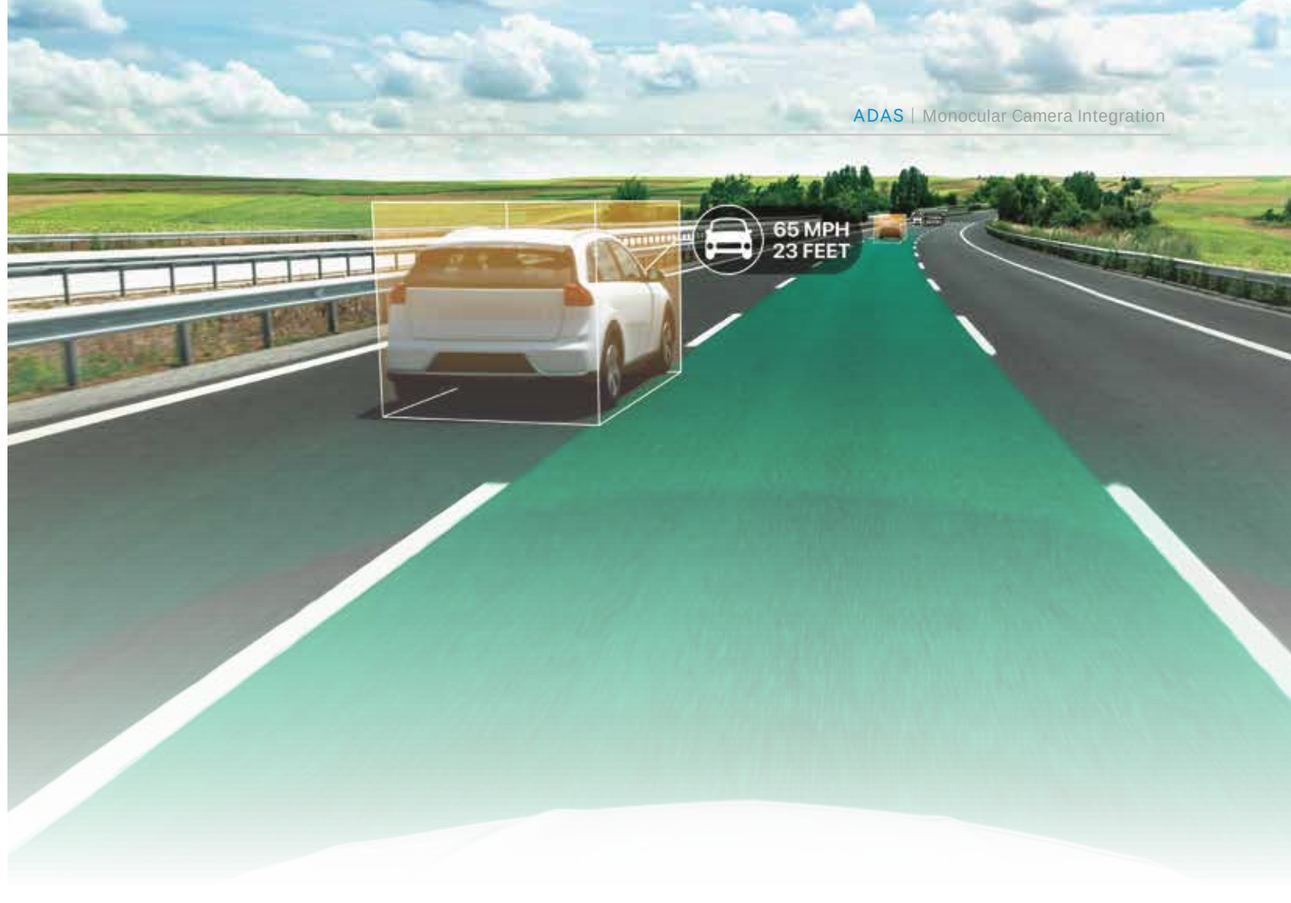
单目一体机



ACC支持120KPH对静止目标刹停；
支持识别40m小半径弯道；
支持红绿灯，斑马线，施工区域识别；
支持120° FOV,有效减少视觉盲区；
支持DVR摄像头复用，支持OTA；
支持1V5R扩展，实现拨杆变道；
支持CNCAP2024 5星。

ACC supports braking to stop at 120KPH in the case of stationary objects;
Supports identification of small radius (< 100m) curves;
Supports traffic lights recognition, and construction area reminding;
Supports FOV of 120°, minimizing blind area;
Supports multiple use of DVR camera and OTA;
Support 1V5R expansion, to achieve the lever change;
Supports CNCAP2024 5 stars.

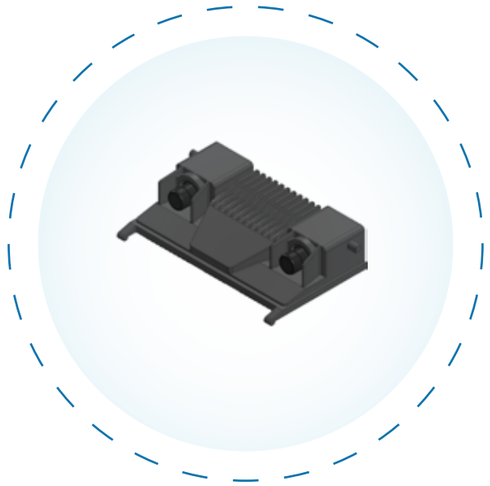
应用场景 / Application Scenarios



产品参数 / Product Parameters

工作电压 / Operating Voltage	12V，6~18V
典型电流 / Operating Current	< 0.9A
典型功耗 / Typical Power Consumption	< 10W
分辨率 / Resolution	3840 x 2160
最高帧率 / Max framerate	30fps
动态范围 / Dynamic Range	140dB， 3或4曝光 / Exposure Exposure 3/4
视场角 / FOV	H-121°, V-54.8°
工作温度 / Operating Temperature	-40°C ~ +85°C
储存温度 / Storage Temperature	-40°C ~ +105°C
防护等级 / IP Grade	IP52
功能 / Function	ICA，TJA，ACC S&G， LKA/LCC，FCW/AEB， IHC， TSR...
升级配置 / Optional Configuration	支持行车变道升级(Support Lane Change Upgrading)：LCA，TLC，HWA，DOW... 支持分时行泊一体升级(Supports Upgrading of Time-sharing Integration of Driving and Parking:)：APA+，RPA...

STEREO CAMERA INTEGRATION
双目一体机



基于双目立体测距原理，集成保隆新一代MoNET深度学习网络和图像处理算法，合并ADAS算法实现智能驾驶功能。

Based on the principle of binocular stereo ranging, it integrates the new generation of MoNET deep learning network and image processing algorithm, and combines ADAS algorithm to realize intelligent driving function.

应用场景 / Application Scenarios

自动紧急制动 AEB

前方碰撞预警 FCW

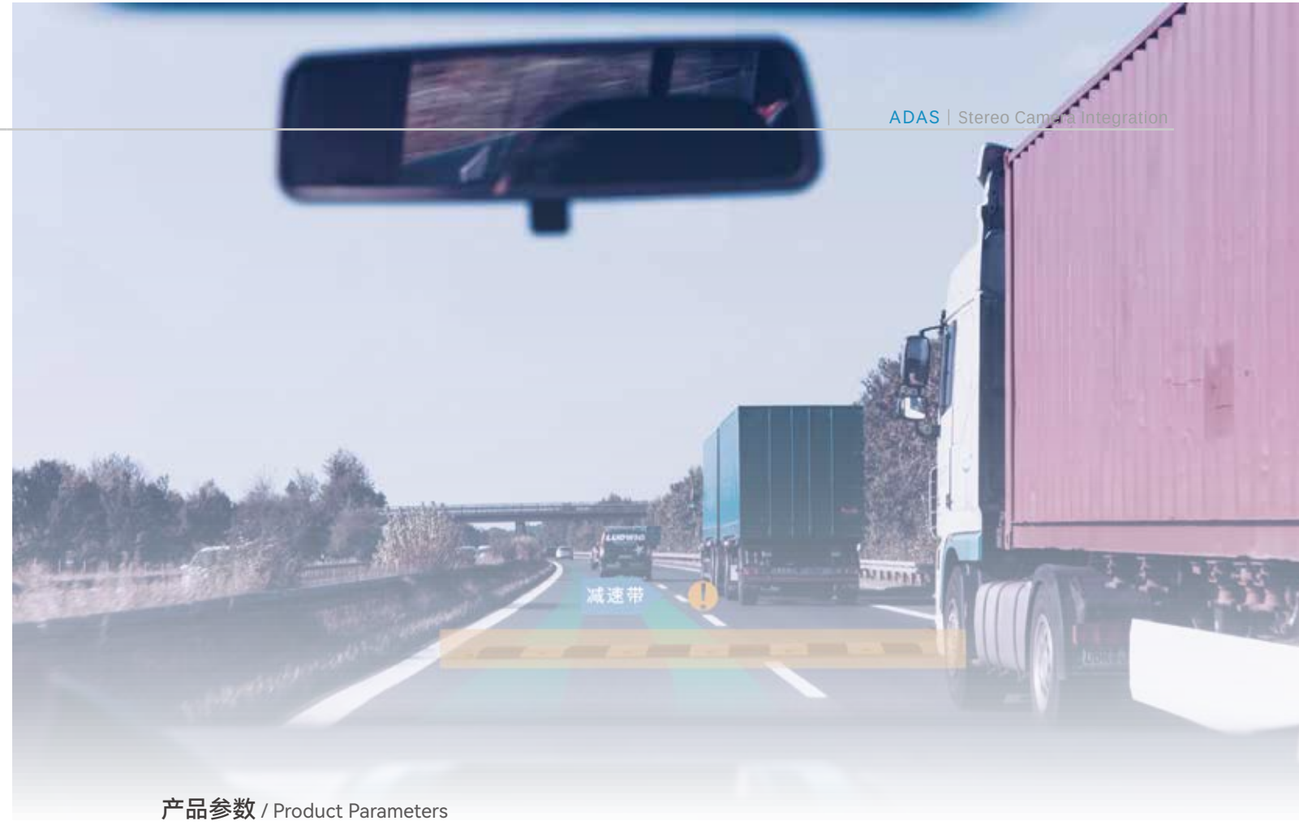
车道偏离预警 LDW

自适应巡航 ACC

交通拥堵辅助 高速智能领航 TJA/ICA

驾驶员指令变道 ILC

智能大灯 IHC



产品参数 / Product Parameters

2M 双目摄像头 / 2-million-pixel Stereo Camera For ADAS Function

工作电压 / Operating Voltage	9~36V
额定功率 / Rated Power	6W
额定电压 / Rated Voltage	12 V
静态电流 / Quiescent Current	0uA
分辨率 / Resolution	1920*1080
视场角 / FOV	HFOV：95°，VFOV：47°
动态范围 / Dynamic Range	Up to 120dB
帧率 / Frame Rate	20fps
通信特性 / Communication Features	首帧报文发送时间 Transmission Time of The First Frame Message：<250ms
工作环境 / Working Environment	工作温度 / Operating Temperature)：-40℃~+85℃ 存储温度 / Stroge Temperature)：-40℃~+105℃
一般障碍物检测 / General obstacle Detection	锥桶、施工标志牌、三角警示牌、非白名单目标 / Cones、Construction Signs、Diversion Signs、Warning Triangles、Non-White Listed Targets.
距离 / Distance	锥桶 / Cones：Distance > 40m 施工标志牌/ Construction Signs: Distance > 40m 导流牌 / Diversion Signs：Distance > 40m 三角警示牌/Warning Triangles：Distance > 40m 非白名单目标/Non-White Listed Targets：Distance > 40m
防护等级/ IP Grade	IP5K2
功能 / Function	ICA，TJA，ACC S&G， LKA/LCC，FCW/AEB， IHC， TSR...
感知延迟 / Perceptual Delay	110-140ms

IN-CABIN MONITORING SYSTEM

智能座舱监测系统

高性价比座舱视觉集成方案，带来更便捷更安全的驾乘体验，领先的全自研算法，在现有DMS,OMS,FACE ID基础之上，还率先推出EYE ON ROAD和DDAW功能，业务涵盖乘用车和商用车，并有多车型量产经验。

This integrated in-cabin system is cost effective and makes driving convenient and safe. Based on a leading fully self-developed algorithm, it has the function of EYE ON ROAD and DDAW, in addition to DMS, OMS, and FACE ID. The system can be used for both passenger vehicles and commercial vehicles and has been mass-produced for several models.

功能介绍 / Application Scenarios

- 人脸识别 Face Identification
- 疲劳与瞌睡监测 Fatigue and Sleepiness Monitoring
- 注意力不集中监测 Inattention Monitoring
- 打电话监测 Phone Call Monitoring
- 吸烟监测 Smoking Monitoring
- 喝水监测 Drinking Monitoring
- 长时间驾驶监测 Long Driving Monitoring
- 视线跟踪 Eye Tracking
- 手势识别 Gesture Recognition
- OMS 生物遗留 Living Body Detection
- 睡意分级(欧盟强标) Level of Sleepiness (EU Standard)
- 镜头遮挡 Lens Sheltered

产品参数 / Product Parameters

Controller

静态电流 / Quiescent Current	<0.5mA(系统 / System)
工作电压 / Operating Voltage	9-16V
Can工作电压 / Can Operating Voltage	6.5V-18V
存储温度 / Storage Temperature	-40℃~90℃
工作温度 / Operating Temperature	-40℃~85℃
防护等级 / IP Grade	IP52
冷启动时间 / Cold Start	<5s（车外解锁 / Unlock At The Exterior Of The Vehicle)

OMS

产品规格 / Product Specification	200W数字高清支持RGB及IR模式，依据光线强度自动切换 / The 2-million HD digital camera supports RGB and IR modes, and can switch automatically according to light intensity.
供电方式 / Power Supply	控制器供电 / ECU Power Supply
工作电流 / Operating Current	≤150mA
输出信号 / Output Signal	LVDS
视场角 / FOV	水平 / Horizon ≥140°，垂直 / Vertical≥85°
最低照度 / Min Illumination	≥40IRE@0.5Lux
工作温度 / Operating Temperature	-40 ~85℃
存储温度/ Storage Temperature	-40 ~ 90℃
防尘防水 / Dustproof & Waterproof	IP52
信噪比 / SNR	>40dB
帧率 / Frame Rate	30fps

FACE ID

产品规格 / Product Specification	100W高清IR摄像头 /1-million Pixel Hd IR Camera
供电方式 / Power Supply	控制器供电 /ECU Power Supply
工作电流 / Operating Current	≤150mA
输出信号 / Output Signal	LVDS
视场角 / FOV	H>65°，V>35°
最低照度 / Min Illumination	≥40IRE@0.5Lux
工作温度 / Operating Temperature	-40 ~85℃
存储温度/ Storage Temperature	-40 ~ 90℃
防尘防水 / Dustproof & Waterproof	IP52
信噪比 / SNR	>30dB
帧率 / Frame Rate	30fps
识别速率 / Identification Rate	< 1s
准确率 / Accuracy	> 99.5%

DMS

产品规格 / Product Specification	100W高清IR摄像头 / 1-million Pixel Hd IR Camera
供电方式 / Power Supply	控制器供电 / ECU Power Supply
工作电流 / Operating Current	<150mA
输出信号 / Output Signal	LVDS
视场角 / FOV	水平 / Horizon>65°，垂直 / Vertical>35°
防护等级 / IP Grade	IP52
工作温度 / Operating Temperature	-40℃~85℃
存储温度 / Storage Temperature	-40℃~90℃
防尘防水 / Dustproof & Waterproof	IP52
信噪比 / SNR	>30dB
帧率 / Frame Rate	30fps
识别速率 / Identification Rate	< 1s
准确率 / Accuracy	> 99.5%

SHADOW KICKSENSOR SYSTEM SOLUTION

光影脚踢系统方案

光影脚踢系统实现当车辆停止，驾驶员到达车尾门处时，车辆通过光学投影技术在地面投射指定图案，驾驶员只需轻轻一踩，尾门就会自动打开的一种创新技术。与传统脚踢传感方案相比，系统使用智能光电方案，具有用户体验友好、操作直观、可靠性高、低功耗以及抗电磁干扰能力强等优点，尤其在新能源汽车应用上有积极作用。

Shadow Kick Sensor system solution realizes automatic tailgate opening by using an innovative sensing technology, the system is activated when the vehicle stops and the driver reaches the tailgate. The device projects a specified pattern on the ground, when the driver steps on this projected icon, the tailgate will open automatically. Compared to traditional kick sensing schemes, our system is based on intelligent optoelectronic sensing technology, giving the advantages of user-friendly experience, intuitive operation, high reliability, low power consumption and high resistance to EM perturbation especially in new energy cars.

应用场景 / Application Scenarios

自动尾门
Automated Trunk Opening

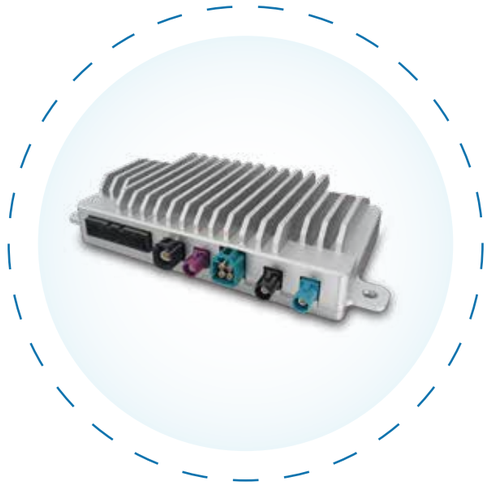
智能交互
Intelligent Interaction

产品参数 / Product Parameters

工作电压 / Operating Voltage	额定电压 : 12V DC，由整车B+供电，工作电压范围：DC9~16V / Rated Voltage：12VDC，Powered by Vehicle B+，Operating Voltage Range DC9~16V
工作电流 / Operating Current	≤1A
静态电流 / Quiescent Current	≤0.2mA
启动时间 / Start Time	＜1S
工作温度 / Operating Temperature	-40℃~75℃
存储温度 / Storage Temperature	-40℃~95℃
防护等级 / IP Grade	整体 / In whole：IP67, 前端 / Front：IP69K
图像分辨率/Image Resolution	320*240（pixelsize7.5μm）
视场角/Field Angle	H：≥70°，V：≥40°
帧率/Frame Rate	15fps
有效感应区域/Effective Sensing Region	Φ400mm
投影logo大小/Projected Logo Size	Φ100mm
安装高度/Installation Height	400~600mm
投影logo照度/Projected Logo Illumination	≥5000Lux
亮度均匀性/Brightness Uniformity	≥60%

SEPARATE DRIVING AND PARKING DOMAIN CONTROLLER (LOW COMPUTING POWER)

小算力行泊分体机



极致性价比域控方案，可实现L2+ 智驾功能，支持分时泊车功能，并支持拓展NOA功能。可接入1颗8M前视摄像头，和4颗环视摄像头，5颗毫米波，12颗超声波。

This cost-effective ADAS Domain Cotroller can provide L2+ ADAS functions, APA function and also NOA function with one front 8 Megapixel camear,4 fisheye camears,5 radars and 12 Ultrasonic radars.

产品参数 / Product Parameters

接口能力 / Interface Ability	支持1路前视摄像头，5路毫米波雷达，4路环视，12颗超声波雷达
ADAS功能 / ADAS Function	· L2+智能驾驶 ·分时智能泊车 ·支持数据回传，OTA
通讯接口 / Communication Interface	6×CAN + Ethernet
视场角 / FOV	H120° / V54°
动态范围 / Dynamic Range	140dB HDR
探测范围 / Detection Range	·车辆/Vehicle >250m ·车道线/Lane >150m ·行人/Pedestrian>100m
典型尺寸 / Typical Size	164*89.6*33mm
防护等级 / IP Grade	IP52

功能列表 / Function List

	前视觉 / Front View	前雷达 / Front Radar	4环视 12超声波 / 4 AVC 12USS
前向碰撞制动、预警 NCAP五星 / AEB/FCW	必须/Must	更好/Better	-
智能远近光灯 / IHC	必须/Must	-	-
道路标志识别/智慧车速限制 / TSR/ISA	必须/Must	-	-
侧向偏离预警 / LDW	必须/Must	-	-
侧向偏离辅助 / LDP	必须/Must	-	-
智能自适应巡航 / SMART ACC	必须/Must	更好/Better	-
全速居中辅助（含 智慧躲闪）/ LCC/TJA	必须/Must	更好/Better	-
DVR 视频输出/DVR Radio OutPut	必须/Must	-	必须/Must
自动/遥控泊车 / APA/PRA	-	-	必须/Must
循迹倒车 / Track Back Assist	-	-	必须/Must
透明底盘 / Transparent Bottom	-	-	必须/Must
360环视 / 360AVM	-	-	必须/Must

应用场景 / Application Scenarios

DOMAIN CONTROLLER FOR DRIVING AND PARKING（MEDIUM OMPUTING POWER ）

中算力行泊域控

智能驾驶6V5R（（1前视双目摄像头+4环视摄像头 + 5毫米波雷达）可充分满足L2、L2 + 等不同级别自动驾驶　对行车及泊车的功能要求，包括高速公路辅助驾驶、记忆泊车等。依靠高效的软件算法实现前视、后视、环视等全方位视觉感知与融合，实现高速NOA 导航辅助、自　动紧急制动、智能泊车及召唤等丰富的行车、泊车与主动安全功能，支持实现大数据上传，数据闭环，支持实现魔毯功能。

The intelligent drive solution 6V5R (6 cameras + 5-millimeter wave radars) fully meets the functional requirements of L2 and L2+, including highway assisted driving, trained parking, etc. The efficient software algorithm allows perception of the front, rear, and surrounding views, so that high-speed NOA assistance, automatic emergency braking, intelligent parking and calling can be realized, Support to achieve big data upload, data closed loop,Supports the magic carpet function.

应用场景 / Application Scenarios

高速智能领航
ICA

智能辅助变道
ALC

自动辅助导航驾驶
NOA

自动泊车
APA

远程泊车
RPA

自主代客泊车
AVP

产品参数 / Product Parameters

主要功能 / Main Function	·6V5R: L2++ ICA、ALC，NOA · 4V 12USS: APA、 RPA，SLAM、AVP
典型算力 / Typical Computing Ability	·AI：58Tops ·MCU：ASIL-D，~5kDMIPS
存储 / Storage	·LPDDR4: 4GB ·Nor Flash: 256MB ·EMMC：16GB
通讯接口 / Communication Interface	·CAN: 6+CH, CAN-FD ·Eth: 4+通道s / 4 Channels ·USB、UART
板载其它接口 / Other Interfaces	·显示：FPDLink，以太网视频流 / Dispplay: FPDLink，Ethernet Video Flow ·扩展SATA3.0硬盘接口 / Extension: SATA 3.0 Hard Disk Interface
电源输入 / Power Suuply	6~18V
典型功耗 / Typical Power Consumption	30W
防护等级 / IP Grade	IP52

功能示意图 / Functional Diagram

舱外双目摄像头
捕捉路面信息
Stereo Camera Captures Road Condition

立体匹配得到
路面深度图
Stereo Matching To Get 3D Dot Map of Road Surface

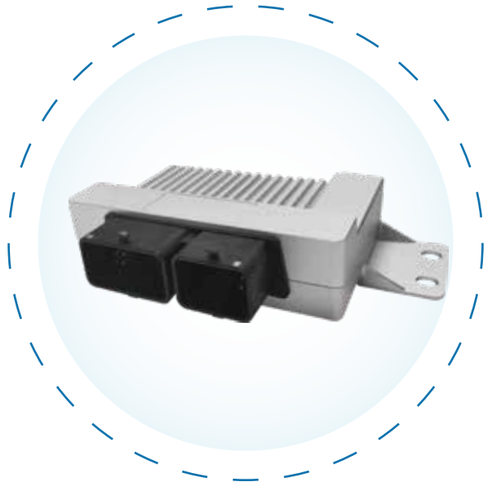
计算目标
高程尺寸
Pcm Algorithm Calculates Object Size

路面目标的高度和
距离
Fusion of Object's Distance, Size and Type

空悬系统主动CDC
控制系统
The CDC System Obtains Target Information In Real Time and Controls The Body Accordingly

INTELLIGENT SUSPENSION CONTROLLER

智能悬架控制器



智能悬架控制器作为悬架系统的核心部件，能够针对驾驶员需求、车辆状态和路面形态，同步控制空气弹簧系统和电控减振器系统，全面调节悬架高度、刚度和阻尼，提升驾乘品质。

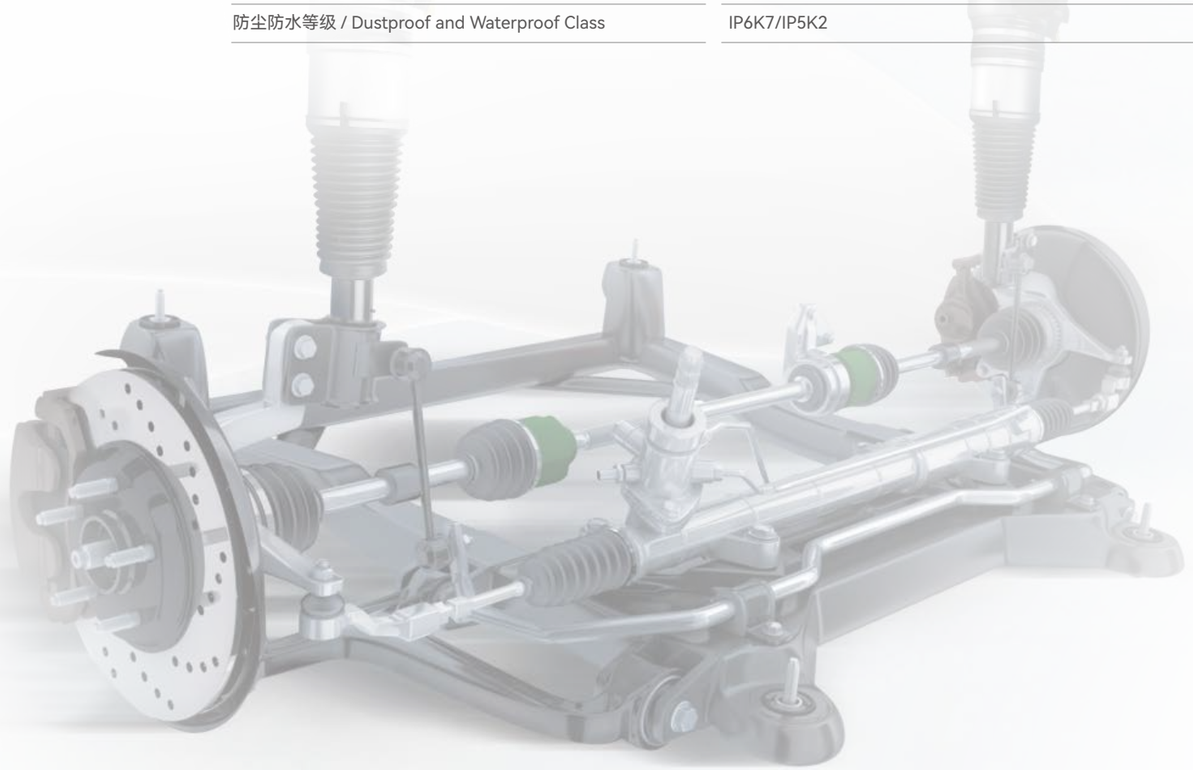
As the core component of the suspension system, the intelligent suspension controller can synchronously control the air spring system and the electronic damper system， according to the driver's demand, vehicle state and road shape, comprehensively adjust the suspension height, stiffness and damping, and improve the driving quality.

应用场景 / Application Scenarios

- 悬架高度随车速调节 Suspension Height Adjusted With The Vechile Speed
- 轻松载物 Easy Load
- 便利下车 Convenient Drop-Off
- 悬架刚度瞬间切换 Suspension Stiffnes Switch Instantly
- 悬架阻尼实时调节 Suspension Damping Is Adjusted In Real Time

产品参数 / Product Parameters

功能安全目标 / Functional Safety Goal	ASIL B
网络安全（R155/R156) / Cyber Security （R155/R156)	支持 / Support
AUTOMOTIVE SPICE流程体系 / Process System	ASPICE-CL2
CDC驱动 / CDC Driver	4通道 / 4 Channels
空簧驱动 / ECAS Driver	11通道 / 11 Channels
PSI5通信 / PSI5 Communication	支持 / Support
内置IMU / Built-In IMU	支持 / Support
AUTOSAR	支持 / Support
OTA软件升级、AB备份 / OTA Software Upgrading 、AB Back Up	支持 / Support
定期唤醒 / Timed Wake-Up	支持 / Support
睡眠电流 / Sleeping Current	≤ 0.1mA
CAN通讯 / CAN Communication	2路CAN / 2-Channels CAN
模拟信号接口 / Analog Signal Interface	支持 / Support
PWM信号接口 / PWM Signal Interface	支持 / Support
标定接口 / Calibration Interface	XCP
安装位置 / Installation Position	驾驶舱或尾舱 / Cockpit or After Compartment
工作环境温度 / Operating Ambient Temperature	-40℃ ~ +85℃
储存温度 / Storage Temperature	-40℃ ~ +105℃
振动等级 / Vibration Level	2.8g随机振动@10-1000HZ / 2.8g Random Vibration @10-1000hz
防尘防水等级 / Dustproof and Waterproof Class	IP6K7/IP5K2



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