

Automotive Display, Center Console and Cluster Industry Report, 2024

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Automotive display has become a hotspot major automakers compete for to create personalized and differentiated vehicle models. To improve users' driving experience and meet their needs for human-computer interaction, vehicle display technology keeps updating and iterating.

From the product releases at major exhibitions, it can be seen that main panel manufacturers, Tier 1 suppliers and automakers have introduced privacy screens, transparent displays, foldable/rollable (flexible) screens, lifting/sliding screens, and light field screens, as well as multiple innovative display technologies such as integration of display and interior and integration of display and lighting. Display technology is rapidly evolving from LCD to OLED, MiniLED and MicroLED. These technologies will change the conventional display and interaction modes.

All major suppliers and automakers have deployed anti-peeping screens which have been seen in cars.

In some cars equipped with a co-pilot seat display, it is inevitable that the driver is disturbed and distracted by the content displayed on the screen or its light when driving. The vehicle display capable of anti-disturbance can effectively prevent the driver from being distracted by screen information and light, while providing entertainment services for the front seat passenger, further ensuring driving safety. At present, vehicle display Tier 1 suppliers such as Continental, Visteon and Marelli, and panel manufacturers like LGD, BOE, and TCL CSOT have released such products for anti-peeping display in the car and higher driving safety.



Continental Switchable Privacy Display - Sight Comparison between Privacy Mode and Public Mode Switch Key

Continental Switchable Privacy Display integrates two unique backlights into a 12.3-inch screen. A simple touch on the switch key at the bottom of the copilot seat screen enables switching between the Privacy and Public modes. This smart privacy display is expected to be rolled out in 2024.



Source: Continental



Summary of Some Models with Privacy Screens on Market

Model	Time To Market	Installed Solution	Panel Supplier
Rising R7	Sept. 2022	The copilot seat screen adopts an anti-peep design.	BOE
New Mercedes- Benz E-Class Cars	Jul. 2023	MBUX Superscreen, an ultra-wide front display, is equipped with LGD's Switchable Privacy Mode (SPM), a viewing angle control technology to control the copilot seat screen's viewing angles to prevent the driver from being distracted by the content on the screen. This mode dims the screen and thus blocks the driver's sight.	LGD
Audi Q6 e-tron	To be launched in China in 2024	The 10.9-inch front passenger display has Active Privacy Mode with anti- peep function.	/
2024 Xpeng G9	Sept. 2023	e in a. com	BOE

Source: ResearchInChina



Of course, this concept of anti-peeping for privacy protection isn't just seen in exhibits. Rising R7, a model launched on market in September 2022, has such anti-peeping design of the copilot seat screen for the safety of the driver. In addition, new Xpeng G9, new Mercedes-Benz E-Class cars, and Audi Q6 e-tron to be available on the Chinese market in 2024 are already equipped with anti-peeping screens.

Exterior interaction is evolving towards the lighting + display integration.

As vehicle intelligence speeds up, automotive lighting has also entered the era of intelligent lighting featuring unbounded interaction and cross-domain integration. In addition to the lighting function, intelligent vehicles also introduce display functions into lights using new intelligent headlight technologies such as DLP and Micro LED, allowing lights to have more interactions with the driver. There is a trend towards the display + lighting integration, enabling human-vehicle interaction inside and outside vehicles, vehicle-vehicle interaction and vehicle-road interaction.

The intelligent light information interaction system gives vehicle lights social attributes, and allows them to carry and display much more information and directly show "the vehicle's emotions" and the driving intent towards pedestrians. For example, the Intelligent Social Display Marelli exhibited at CES 2024 provides new opportunities for illumination and communication via light, on and around the vehicle. This technology is developed to support vehicle-to-x communication while giving OEMs the freedom to customize messages.



The Intelligent Social Display can indicate when the car is in autonomous mode, signal driver intent, and communicate to pedestrians with messages such as "safe to cross" when approaching an intersection or crosswalk.

There are many integration options available with the Intelligent Social Display. Automotive OEMs are integrating the displays into the front and side of the vehicle, offering on-demand functionality and customized patterns for safety and socializing. Use cases for integration in the rear include using symbols to convey environmental scenarios such as a traffic jam, accident ahead, or unsafe driving conditions.

Marelli is in series production with two Chinese automakers with mid-resolution displays integrated into the vehicle front. For integration within the rear lamp or trunk surface, a second generation of high-resolution displays based on mini-LED technology is in development and can also achieve homologated lighting functions.

Marelli Intelligent Social Display



Source: Marelli



DLP lights of IM L7

In IM L7's case, the DLP lights of IM L7 are equipped with HASCO Vision's digital signal light ISC system, namely, "intelligent interactive taillight" which is actually a DLP technology supplement for the headlights. The Interactive Signal Communication (ISC) technology allows for display of information to front and rear traffic participants such as vehicles and pedestrians in the form of images and texts, for example, when DLP prompts the front pedestrians to go first, the rear display area will show "please give way to pedestrians passing".

The personalized custom light interaction function enables the custom taillight effect, displaying different colors and patterns according to user's mood. Combining DLP and ISC, IM L7 transforms car lights from function-defined scenarios to scenario-defined functions, that is, manufacturers only provide basic lighting hardware which is then upgraded over the air (OTA) when producing cars. As autonomous driving and V2X develop, all traffic participants have new interaction needs. The intelligent light information interaction system can support indepth OTA updates.

IM L7's ISC intelligent interactive taillight packs TI TLC6C5748-Q1, an automotive 48-channel LED driver. Through controlling the highly integrated independent LED pixels, it drives a total of 5,000+ LED units in the front and rear of the car, and enables 255 levels of individually adjustable brightness two-color control. Moreover, the adoption of an LED direct drive solution reduces much power consumption of the ISC module, thereby ensuring that IM L7 can have a longer cruising range.



Source: IM Motors



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Comparison between Some Intelligent Light Information Interaction Display Products





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The front cabin cluster + center console discrete layout is mainstream, and there is still a trend towards large and multiple screens.

Since Tesla adopted the 17-inch large center console display, car center consoles have entered the era of large screens. Since then, sundry designs have begun to emerge, such as horizontal screen, vertical screen, dual display, triple display, and integrated display.

In terms of some new models launched in China in 2023 and 2024, 24 in total here, the front cabin discrete cluster + center console layout is still mainstream. Wherein, there are 3 models using the single display solution (center console screen), namely, Changan NEVO A07, Changan Deepal S7 and ARCFOX aT5; 15 models using the discrete solution, such as ZEEKR 009, new NIO ES6, GAC Hyper GT, Denza N7, Geely Galaxy L6 and ZEEKR 007; 4 models using multi-screen display design, namely, Rising F7, 2024 New Voyah Dreamer, Haval Fierce Dragon MAX and Kia EV5; only two models using an integrated through-type display, namely, Jiyue 01 and Geely Galaxy E8.

Layout of Front Row Display in 2023 New Models (Part) in China





Vehicle displays serve as a medium for humanvehicle interaction. The booming intelligent vehicles have put forward new requirements for vehicle displays which then already become a hotspot major manufacturers compete to deploy. Vehicle displays are no longer restricted to conventional positions and shapes such as center console and cluster. The cockpit also adds a range of new application scenarios such as HUD, copilot seat screen, rear entertainment screen, electronic rearview mirror, and transparent A-pillar.

In the future, vehicle displays will tend to provide better display effects and more precise humancomputer interaction, integrate more functions, and fuse with interiors. Multiple innovative features such as privacy protection and transparent display will bring richer experiences for safe driving and comfortable riding.

Model	Time To Market	Installation	Picture
Geely Galaxy L6	Sept. 2023	10.25-inch narrow-stripe LCD cluster + 13.2-inch vertical center console screen	
Luxeed S7	Nov. 2023	12.3-inch cluster screen + 15.6-inch center console screen	
BYD Song L	Dec. 2023	10.25-inch LCD cluster + 15.6-inch center console screen	
ZEEKR 007	Dec. 2023	13.02-inch cluster screen + 1 <mark>5.0</mark> 5-inch center console screen	Dom.
Xpeng X9	Jan. 2024	10.25-inch cluster screen + 17.3-inch center console screen	
Jiyue 01	Jan. 2023	35.6-inch 6K UHD integrated display, with no fragmentation, no blocking and no splicing, with 95% NTSC high color gamut and 10000:1 ultrahigh contrast	Contraction with
Geely Galaxy E8	Jan. 2024	The 45-inch 8K integrated through-type display integrates cluster, center console, and copilot seat screen. Differing from the current three-screen splicing mode on the market, it has one screen spanning from the driver's deat to the copilot seat, and each area of the screen can be operated independently.	
Changan NEVO A07	Sept. 2023	15.4-inch floating center console screen	

Installation of Front Display in Some Models Launched in 2023

Source: ResearchInChina



Table of Content (1)

Chapter 1 Introduction to Vehicle Display

1.1 Overview of Vehicle Display
1.1.1 Vehicle Display Layout
1.1.2 Vehicle Display Technologies
1.1.3 Comparison between Vehicle Display Technologies
1.1.4 AMOLED Display Technology
1.1.5 Mini LED Display Technology
1.1.6 Micro LED Display Technology
1.1.7 Overall Development Trend of Vehicle Display Products
1.1.8 Vehicle Display Product Technology Route
1.1.9 Development Trends of AR-HUD
1.1.10 Cockpit Display Business Layout of Main Companies

1.2 Vehicle Display Market

- 1.2.1 Global Vehicle Display Panel Shipments
- 1.2.2 Global Penetration of Vehicle Display Panels by Size
- 1.2.3 Global Vehicle Display Shipments by Application
- 1.2.4 Global Vehicle Display Panel Shipments, 2023

1.3 Vehicle Display Industry Standards and Automotive Certifications

- 1.3.1 China's Standards and Regulations Concerning Automotive Vehicle Industry
- 1.3.2 Released the Measuring Methods for Optical Performance for Vehicle Headup Display

1.3.3 Released the Motor Vehicles - Devices for Indirect Vision -Requirements of Performance and Installation

- 1.3.4 Introduction to Automotive Specifications for Vehicle Displays
- 1.3.5 Vehicle Display Component Specifications (1)
- 1.3.6 Vehicle Display Component Specifications (2)

1.4 Evolution Trends of Vehicle Display Supply Chain
1.4.1 Supply Chain Evolution (1): Evolution of Global Vehicle Display Panel Supply Chain Pattern
1.4.2 Supply Chain Evolution (2)
1.4.3 Supply Chain Evolution (3)

- 1.5 Localization of Vehicle Display ICs in China
- 1.5.1 Classification of Vehicle Display ICs
- 1.5.2 Global Display Driver IC Demand and Market Size
- 1.5.3 China's Display Driver IC Demand and Market Size
- 1.5.4 Vehicle Display Becomes A Downstream Incremental Market of DDIC
- 1.5.5 Global Automotive DDIC Market Pattern
- 1.5.6 Localization of Automotive DDIC in China
- 1.5.7 Layout of Global Automotive DDIC Suppliers (1)
- 1.5.8 Layout of Global Automotive DDIC Suppliers (2)
- 1.5.9 Automotive DDIC Industry Chain

1.5.10 The Development of DDIC in China Is Hindered by Manufacturing and Production Capacity

- 1.5.11 The Penetration of TDDI in Automotive Displays Keeps Rising
- 1.5.12 Global Automotive TDDI Shipments, 2021-2030E
- 1.5.13 Competitive Landscape of Global Automotive TDDI Market
- 1.5.14 Localization of Automotive TDDI in China
- 1.5.15 Layout of Global Automotive TDDI Suppliers (1)
- 1.5.16 Layout of Global Automotive TDDI Suppliers (2)
- 1.5.17 Vehicle Display Driver IC Solutions (1)
- 1.5.18 Vehicle Display Driver IC Solutions (2)
- 1.5.19 Vehicle Display Driver IC Solutions (3)
- 1.5.20 Vehicle Display Driver IC Solutions (4)



Table of Content (2)

Chapter 2 Vehicle Display Layout Trends and Forward-looking Designs

- 2.1 Vehicle Display Layout Trends in Main Sub-scenarios
- 2.1.1 Cluster and Center Console Screens
- 2.1.1.1 Main Layout Modes of Cluster and Center Console Screens
- 2.1.1.2 Layout of Cluster and Center Console Screens
- 2.1.1.3 Summary of Some Single-screen Models Launched in 2023
- 2.1.1.4 Summary of Some Discrete-screen Models Launched in 2023 (1)
- 2.1.1.5 Summary of Some Discrete-screen Models Launched in 2023 (2)
- 2.1.1.6 Summary of Some Discrete-screen Models Launched in 2023 (3)
- 2.1.1.7 Summary of Some Dual-display Models Launched in 2023
- 2.1.1.8 Summary of Some Integrated-display Models Launched in 2023
- 2.1.1.9 Integrated Display Solutions of Suppliers
- 2.1.1.10 Layout Trends of Cluster and Center Console Screens
- 2.1.2 Rear Entertainment Screen
- 2.1.2.1 Rear Entertainment Screen Layout Scheme 1
- 2.1.2.2 Rear Entertainment Screen Layout Scheme 2
- 2.1.2.3 Other Layout Modes for Rear Screens
- 2.1.2.4 Rear Entertainment Screen Layout Trends
- 2.1.2.5 Installation of Rear Entertainment Screens in China's Passenger Car Market, 2023
- 2.1.2.6 Summary of Models Equipped with Rear Entertainment Screens
- 2.1.3 Electronic Rearview Mirror
- 2.1.3.1 Electronic Interior and Exterior Rearview Mirror Systems
- 2.1.3.2 Installation Trends of Streaming Media Interior Rearview Mirror
- 2.1.3.3 Advantages of Electronic Exterior Rearview Mirror
- 2.1.3.4 Disadvantages of Electronic Exterior Rearview Mirror
- 2.1.3.5 Cost of Electronic Exterior Rearview Mirror
- 2.1.3.6 The Cost of Electronic Exterior Rearview Mirrors Is High and "Optional" Will Be Mainstream in the Short Term

- 2.1.3.7 Electronic Exterior Rearview Mirror: User Experience (1)
- 2.1.3.8 Electronic Exterior Rearview Mirror: User Experience (2)
- 2.1.3.9 Electronic Exterior Mirror Market Size and Penetration Rate in China

2.1.3.10 In-vehicle Display Layout Schemes for Electronic Exterior Rearview Mirrors

2.1.3.11 Summary of Models Equipped with Electronic Exterior Rearview Mirrors (1)

- 2.1.3.12 Summary of Models Equipped with Electronic Exterior Rearview Mirrors (2)
- 2.1.3.13 Summary of Models Equipped with Electronic Exterior Rearview Mirrors (3)
- 2.1.3.14 Summary of Electronic Exterior Rearview Mirror Suppliers and Their Product Layout (1)
- 2.1.3.15 Summary of Electronic Exterior Rearview Mirror Suppliers and Their Product Layout (2)
- 2.1.3.16 Summary of Electronic Exterior Rearview Mirror Suppliers and Their Product Layout (3)
- 2.1.3.17 Summary of Electronic Exterior Rearview Mirror Suppliers and Their Product Layout (4)
- 2.1.3.18 Electronic Exterior Rearview Mirror Display Solutions
- 2.1.4 Copilot Seat Screen
- 2.1.4.1 Summary of Models Equipped with Copilot Seat Screen and Installation (1)
- 2.1.4.2 Summary of Models Equipped with Copilot Seat Screen and Installation (2)
- 2.1.4.3 Summary of Models Equipped with Copilot Seat Screen and Installation (3)
- 2.1.4.4 The Size and Layout of Copilot Seat Screen Become Ever More Diverse (1)
- 2.1.4.5 The Size and Layout of Copilot Seat Screen Become Ever More Diverse (2)
- 2.1.4.6 The Size and Layout of Copilot Seat Screen Become Ever More Diverse (3)
- 2.1.4.7 The Price Threshold of Copilot Seat Screen Is Becoming Lower
- 2.1.4.8 Copilot Seat Screen Is Applicable to Ever More Car Models
- 2.1.4.9 More Fuel-powered Vehicles Are Equipped with Copilot Seat Screen

2.2 Vehicle Display Forward-looking Designs



Table of Content (3)

- 2.2.1 Vehicle Display Anti-peeping Technology 2.2.1.1 Vehicle Display Forward-looking Design 1 2.2.1.2 Anti-peeping Vehicle Display Solutions (1) 2.2.1.3 Anti-peeping Vehicle Display Solutions (2) 2.2.1.4 Summary of Anti-peeping Vehicle Display Solutions of Tier 1 Suppliers 2.2.1.5 Layout of Anti-peeping Vehicle Display Panel Suppliers (1) 2.2.1.6 Layout of Anti-peeping Vehicle Display Panel Suppliers (2) 2.2.1.7 Layout of Anti-peeping Vehicle Display Panel Suppliers (3) 2.2.1.8 Summary of Launched Models with Anti-peeping Display 2.2.2 Transparent Display Technology 2.2.2.1 Vehicle Display Forward-looking Design 2 2.2.2.2 Innovative Transparent Vehicle Display Technology (1) 2.2.2.3 Innovative Transparent Vehicle Display Technology (2) 2.2.2.4 Transparent Vehicle Display Solutions (1) 2.2.2.5 Transparent Vehicle Display Solutions (2) 2.2.2.6 Transparent Vehicle Display Solutions (3) 2.2.2.7 Transparent Vehicle Display Products and Manufacturers (1) 2.2.2.8 Transparent Vehicle Display Products and Manufacturers (2) 2.2.2.9 Transparent Vehicle Display Products and Manufacturers (3) 2.2.2.10 Application Dilemmas for Transparent Display 2.2.3 Foldable/Rollable (Flexible) Screen 2.2.3.1 Vehicle Display Forward-looking Design 3 2.2.3.2 Foldable/Rollable (Flexible) Screen Solutions (1) 2.2.3.3 Foldable/Rollable (Flexible) Screen Solutions (2) 2.2.3.4 Foldable/Rollable (Flexible) Screen Solutions (3) 2.2.3.5 Foldable/Rollable (Flexible) Screen Solutions (4) 2.2.3.6 Foldable/Rollable (Flexible) Vehicle Display Products and Manufacturers (1) 2.2.3.7 Foldable/Rollable (Flexible) Vehicle Display Products and Manufacturers (2) 2.2.4 Lifting/Sliding Screen
- 2.2.4.1 Vehicle Display Forward-looking Design 4 2.2.4.2 Models Applying Sliding Display 2.2.4.3 Models Applying Lifting Display 2.2.4.4 Lifting/Sliding Vehicle Display Solutions (1) 2.2.4.5 Lifting/Sliding Vehicle Display Solutions (2) 2.2.4.6 Moving/Rotating Vehicle Display Products and Manufacturers 2.2.5 Invisible Display 2.2.5.1 Vehicle Display Forward-looking Design 5 2.2.5.2 Invisible Vehicle Display Technical Solutions (1) 2.2.5.3 Invisible Vehicle Display Technical Solutions (2) 2.2.5.4 Invisible Vehicle Display Technical Solutions (3) 2.2.5.5 Invisible Vehicle Display Technical Solutions (4) 2.2.5.6 Invisible Vehicle Display Products and Manufacturers (1) 2.2.5.7 Invisible Vehicle Display Products and Manufacturers (2) 2.2.5.8 Invisible Vehicle Display Products and Manufacturers (3) 2.2.6 Display and Lighting Integration 2.2.6.1 Vehicle Display Forward-looking Design 6 2.2.6.2 Lighting-display Integration Solutions (I) 2.2.6.3 Automotive DLP Light Solutions (1) 2.2.6.4 Automotive DLP Light Solutions (2) 2.2.6.5 Automotive DLP Light Application Cases (1) 2.2.6.6 Automotive DLP Light Application Cases (2) 2.2.6.7 Automotive DLP Light Application Cases (3) 2.2.6.8 Automotive DLP Pixel Lights Suppliers and Solutions 2.2.6.9 Installation of Automotive DLP Lights by OEMs 2.2.6.10 Lighting-display Integration Solutions (II) 2.2.6.11 Automotive Micro LED Light Solutions 2.2.6.12 Automotive Micro LED Light Application Cases 2.2.6.13 Automotive Micro LED Light Tier 1 Suppliers and Solutions (1)



Table of Content (4)

- 2.2.6.14 Automotive Micro LED Light Tier 1 Suppliers and Solutions (2)
- 2.2.6.15 Lighting-display Integration Solutions (III)
- 2.2.6.16 Intelligent Light Information Interaction Solutions (1)
- 2.2.6.17 Intelligent Light Information Interaction Solutions (2)
- 2.2.6.18 Intelligent Light Information Display Tier 1 Suppliers and Solutions (1)
- 2.2.6.19 Intelligent Light Information Display Tier 1 Suppliers and Solutions (2)
- 2.2.7 Other Vehicle Display Forward-looking Designs
- 2.2.7.1 Vehicle Display Forward-looking Design 7
- 2.2.7.2 Vehicle Display Forward-looking Design 8
- 2.2.7.3 Vehicle Display Forward-looking Design 9
- 2.2.7.4 Vehicle Display Forward-looking Design 10
- 2.2.7.5 Vehicle Display Forward-looking Design 11
- 2.2.7.6 Vehicle Display Forward-looking Design 12
- 2.2.7.7 Vehicle Display Forward-looking Design 13
- 2.2.7.8 Vehicle Display Forward-looking Design 14

Chapter 3 Development Trends of Vehicle Display Technology

- 3.1 Vehicle Display Technology Trends
- 3.1.1 Development Trends of Vehicle Display Technology in EEA Evolution Trend
- 3.1.2 Development Phases of Vehicle Display Technology
- 3.1.3 Global Shipments of Different Vehicle Display Technologies
- 3.1.4 Global Penetration Rates of Different Vehicle Display Technologies
- 3.1.5 Comparison between Automotive Mini LED and OLED

3.2 Vehicle OLED Display Technology Trends3.2.1 Advantages of Vehicle OLED Display Technology3.2.2 Risks of Applying Vehicle OLED Display Technology3.2.3 Comparison between Vehicle OLED Backplane Technologies

3.2.4 Vehicle OLED Display Technology Trends (1)

3.2.5 Vehicle OLED Display Technology Trends (2)
3.2.6 Vehicle Display Panels Are Transitioning from LCD to OLED
3.2.7 Automotive OLED Market Size
3.2.8 Demand for Automotive Flexible/Rigid OLED Displays
3.2.9 Status Quo of Global Automotive OLED Market
3.2.10 Installation of OLED Displays in 2023 New Models (1)
3.2.11 Installation of OLED Displays in 2023 New Models (2)
3.2.12 Installation of OLED Displays in 2023 New Models (3)
3.2.13 MINI Launched A 9.4-inch Round OLED Center Console Display (1)
3.2.15 Summary of Layout of Vehicle OLED Display Suppliers (1)
3.2.17 Summary of Layout of Vehicle OLED Display Suppliers (3)

3.3 Vehicle Mini LED Display Technology Trends

- 3.3.1 Upstream Supply End of Vehicle Mini LED Display
- 3.3.2 Vehicle Mini LED Display Process Flow
- 3.3.3 Advantages of Vehicle Mini LED Display Technology
- 3.3.4 Difficulties in Vehicle Mini LED Display Technology
- 3.3.5 Vehicle Mini LED Display Backlight Module Technology Route Combination
- 3.3.6 Obstacles to Mass Adoption of Mini LED in Vehicles (1)
- 3.3.7 Obstacles to Mass Adoption of Mini LED in Vehicles (2)
- 3.3.8 Vehicle Mini LED Backlight Solutions

3.3.9 Automakers and Panel Suppliers Work to Deploy Vehicle Mini LED Backlight Displays, Driving the Industry Chain

- 3.3.10 Summary of Models Applying Vehicle Mini LED Display (1)
- 3.3.11 Summary of Models Applying Vehicle Mini LED Display (2)
- 3.3.12 Summary of Models Applying Vehicle Mini LED Display (3)
- 3.3.13 Summary of Models Applying Vehicle Mini LED Display (4)



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Table of Content (5)

3.3.14 Summary of Models Applying Vehicle Mini LED Display (5) 3.3.15 Summary of Layout of Vehicle Mini LED Display Suppliers (1)

3.3.16 Summary of Layout of Vehicle Mini LED Display Suppliers (1)

3.3.17 Summary of Layout of Vehicle Mini LED Display Suppliers (2)

- 3.3.18 Summary of Layout of Vehicle Mini LED Display Suppliers (4)
- 3.3.19 Summary of Layout of Vehicle Mini LED Display Suppliers (5)

3.4 Vehicle Micro LED Display Technology Trends

3.4.1 Micro LED Manufacturing Process

3.4.2 Advantages of Vehicle Micro LED Display Technology

3.4.3 Micro LED Displays Have High Transmittance

- 3.4.4 Five Technical Challenges in Vehicle Micro LED Display
- 3.4.5 Vehicle Micro LED Display Application Trends

3.4.6 Technology Bottlenecks in Mass Production of Vehicle Micro LED Display

3.4.7 Vehicle Micro LED Display Market (1)

3.4.8 Vehicle Micro LED Display Market (2)

3.4.9 Vehicle Micro LED Display Solutions

3.4.10 Summary of Layout of Vehicle Micro LED Display Suppliers (1)

- 3.4.11 Summary of Layout of Vehicle Micro LED Display Suppliers (2)
- 3.4.12 Summary of Layout of Vehicle Micro LED Display Suppliers (3)
- 3.4.13 Summary of Layout of Vehicle Micro LED Display Suppliers (4)
- 3.4.14 Summary of Layout of Vehicle Micro LED Display Suppliers (5)
- 3.4.15 Summary of Layout of Vehicle Micro LED Display Suppliers (6)

Chapter 4 Installation of Automotive Displays

4.1 Installation of Automotive Displays in China

4.1.1 Installations of OEM Vehicle Displays (by Purpose) in Passenger Cars in China, 2021-2023

4.1.2 Installation Rate of Vehicle Displays in Passenger Cars (by Type) in China,

2021-2023

4.2 Instillation of LCD Clusters in Passenger Cars in China

4.2.1 Instillations and Instillation Rate of LCD Clusters in Passenger Cars in China, 2023

4.2.2 Instillations and Instillation Structure of LCD Clusters (By Size) in Passenger Cars in China, 2023

4.2.3 Instillations and Instillation Rate of LCD Clusters (By Price) in Passenger Cars in China, 2023

4.2.4 TOP20 Passenger Car Models by LCD Cluster Installation in China, 2023 4.2.5 TOP20 Passenger Car Brands by LCD Cluster Installation in China, 2023

4.3 Instillation of Center Console Screens in Passenger Cars in China

4.3.1 Instillations and Instillation Rate of Center Console Screens in Passenger Cars in China, 2023

4.3.2 Instillations and Instillation Rate of Center Console Screens (By Size) in Passenger Cars in China, 2023

4.3.3 Instillations and Instillation Rate of Center Console Screens (By Price) in Passenger Cars in China, 2023

4.4 Instillation of HUDs in Passenger Cars in China

4.4.1 Instillations and Instillation Rate of HUDs (By Type) in Passenger Cars in China, 2023

4.4.2 Instillations and Instillation Rate of HUDs in Passenger Cars (By Model Price) in China, 2023

4.4.3 TOP20 Passenger Car Models by HUD Instillations in China, 2023

4.4.4 TOP20 Passenger Car Brands by HUD Instillations in China, 2023

4.5 Instillation of Rear Entertainment Screens in Passenger Cars in China



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Table of Content (6)

4.5.1 Instillations and Instillation Rate of Rear Entertainment Screens in Passenger Cars in China, 2023

4.5.2 Instillations of Rear Entertainment Systems (By Price) in Passenger Cars in China, 2023

Chapter 5 Global Vehicle Display System Tier 1 Suppliers

5.1 Continental

- 5.1.1 Profile
- 5.1.2 Cockpit Electronics Product Line
- 5.1.3 Vehicle Display Product Business Route and Summary
- 5.1.4 New Center Console Display Designs (1)
- 5.1.5 New Center Console Display Designs (2)
- 5.1.6 New Center Console Display Designs (3)
- 5.1.7 Center Console Display Business: Customer Base
- 5.1.8 Main Cluster Products
- 5.1.9 HUD Product Business Route and Summary
- 5.1.10 HUD Business: Product Strategy
- 5.1.11 HUD Business: Product Line
- 5.1.12 HUD Business: Augmented Reality Head-up Display (AR-HUD)
- 5.1.13 Innovative HUD Designs (1)
- 5.1.14 Innovative HUD Designs (2)

5.2 Denso 5.2.1 Profile

5.2.2 Cockpit Electronics Product Line

- 5.2.3 Vehicle Display Product Business Route and Summary
- 5.2.4 Automotive Cluster Production Base
- 5.2.5 Vehicle Display Business (1): Vehicle OLED Display Layout
- 5.2.6 Vehicle Display Business (2)

5.2.7 Vehicle Display Business (3)

5.3 Visteon
5.3.1 Profile
5.3.2 Vehicle Display Product Business Route and Summary
5.3.3 Cluster Products
5.3.4 Display Business
5.3.5 New Models Supported by the Center Console and Cluster Displays
Business (Q1-Q3 2023)
5.3.6 Advanced Vehicle Display Technology
5.3.7 Cockpit Display Development Planning
5.3.8 Innovative Vehicle Display Designs (1)
5.3.9 Innovative Vehicle Display Designs (2)
5.3.10 3D Cluster Chips and Processors
5.3.11 3D Cluster Software Development Process

- 5.4 Bosch
- 5.4.1 Profile
- 5.4.2 Layout of Cross-Domain Computing Solutions Division (XC Division)
- 5.4.3 Distribution of Multimedia Division's Production Bases in China
- 5.4.4 Cockpit Electronics Product Line
- 5.4.5 Vehicle Display Business Planning
- 5.4.6 Vehicle Cockpit Display: Intelligent Cockpit Multi-screen Interaction Products
- 5.4.7 Full LCD Cluster
- 5.4.8 Vehicle Cockpit Display: Mirror Cam System Business
- 5.4.9 Vehicle Cockpit Display: Human-Machine Interface (HMI) Business Planning
- 5.5 Forvia
- 5.5.1 Profile



Table of Content (7)

5.5.2 Cockpit Electronics Product Line 5.5.3 Faurecia's Business Planning 5.5.4 Provide Vehicle Display Customization Services 5.5.5 Development of Vehicle Display Business 5.5.6 Center Console Display Business: Product Development Trends 5.5.7 Innovative Vehicle Display Designs 5.5.8 Advanced Vehicle Display Technology 5.5.9 Vehicle Display Technology 5.5.10 Electronic Rearview Mirror Business (1) 5.5.11 Electronic Rearview Mirror Business (2) 5.5.12 Electronic Rearview Mirror Technology 5.5.13 Transparent Door Technology 5.6 Marelli 5.6.1 Profile 5.6.2 Vehicle Display Product Development Trends 5.6.3 New-generation Vehicle Display Technology 5.6.4 Innovative Vehicle Display Designs (1) 5.6.5 Innovative Vehicle Display Designs (2) 5.6.6 Innovative Vehicle Display Solutions: Software-defined Cockpit Experience 5.6.7 Innovative Vehicle Display Cases 5.6.8 Innovative HUD Designs (1) 5.6.9 Innovative HUD Designs (2) 5.6.10 Vehicle Display and Innovative Interaction Applications (1) 5.6.11 Vehicle Display and Innovative Interaction Applications (2)

5.7 Desay SV5.7.1 Profile5.7.2 Cockpit Electronics Product Line

5.7.3 Vehicle Display Product Business Route and Summary
5.7.4 Vehicle Display Technology
5.7.5 Innovative Vehicle Display Designs
5.7.6 HUD Business: AR-HUD
5.7.7 Electronic Rearview Mirror Business: Software and Hardware Integrated
Electronic Rearview Mirror Solution
5.7.8 Innovative Vehicle Display Applications

5.8 ADAYO

- 5.8.1 Profile of Foryou Corporation
- 5.8.2 Intelligent Display Product Layout
- 5.8.3 Foryou Corporation's Vehicle Display Product Business Route and Summary
- 5.8.4 Innovative Vehicle Display Products (1)
- 5.8.5 Innovative Vehicle Display Products (2)
- 5.8.6 Innovative Vehicle Display Products (3)
- 5.8.7 Innovative Vehicle Display Products (4)
- 5.8.8 Innovative Vehicle Display Products (5)
- 5.8.9 Application Cases of Vehicle Display Products (1)
- 5.8.10 Application Cases of Vehicle Display Products (2)
- 5.8.11 Main HUD Products
- 5.8.12 Main Customers of HUD Products
- 5.8.13 AR-HUD Product Development Trends
- 5.8.14 AR-HUD Technology Layout (1)
- 5.8.15 AR-HUD Technology Layout (2)
- 5.8.16 Electronic Interior/Exterior Rearview Mirror Product Matrix
- 5.8.17 Development Route of Electronic Interior/Exterior Rearview Mirrors
- 5.8.18 Function Evolution Route of Electronic Interior/Exterior Rearview Mirror Products
- 5.8.19 Application Scheme of Electronic Interior Rearview Mirror



Table of Content (8)

5.8.20 Features of Electronic Exterior Rearview Mirror Product Solution

5.9 Hangsheng Electronics5.9.1 Profile5.9.2 Customer Base and Suppliers5.9.3 Vehicle Display Layout

5.9.4 HUD Layout

5.10 Hyundai Mobis
5.10.1 Profile
5.10.2 Vehicle Display Product Development Trends
5.10.3 Innovative Vehicle Display Designs (1)
5.10.4 Innovative Vehicle Display Designs (2)
5.10.5 Innovative Vehicle Display Designs (3)
5.10.6 Innovative Vehicle Display Designs (4)
5.10.7 Innovative Vehicle Display Designs (5)
5.10.8 HUD Business
5.10.9 Advanced Vehicle Display and HUD Technologies

5.11 Huawei

5.11.1 Cockpit Product Line

5.11.2 Vehicle Display Business Route and Summary

5.11.3 Development Trends of Intelligent Vehicle Display Products

5.11.4 Innovative Vehicle Display Designs

5.11.5 Vehicle Optical Display Business AutOptiX

5.11.6 Innovative Vehicle Display Applications

5.11.7 Core Technologies of Light Field Screen

5.11.8 HUAWEI xPixel Smart Car Lighting Solution

5.11.9 Development Route of AR-HUD Business

5.11.10 AR-HUD Solutions 5.11.11 AR-HUD Application Cases

5.12 Yuanfeng Technology

5.12.1 Profile

5.12.2 Intelligent Cockpit Product Line

5.12.3 Vehicle Display Product Business Route and Summary

5.12.4 Development Trends of Vehicle Display Products

5.12.5 Vehicle Display Process/Technology

5.12.6 Vehicle Display Technology: New Mini-LED Technology

5.12.7 Summary of Vehicle Display Products, Suppliers and Customers

5.12.8 Camera Monitor System (CMS) Business

5.12.9 Camera Monitor System (CMS): Product Roadmap

5.12.10 Camera Monitor System (CMS): Field of Vision Assistant

5.12.11 Camera Monitor System (CMS) Integrates ADAS Functions: Driving Field of Vision Assistant

5.12.12 Camera Monitor System (CMS): Mass Production Customers

5.12.13 Camera Monitor System (CMS): Application Scheme

5.13 PATEO CONNECT+
5.13.1 Profile
5.13.2 Cockpit Product Line
5.13.3 Vehicle Display Business Route and Summary
5.13.4 Qing Cluster Smart LCD Cluster Products
5.13.5 IVI, HUD, and Rear Entertainment Screen Products
5.13.6 HUD Product Evolution

5.13.7 Qing AR-HUD

5.14 Joyson Electronic



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Table of Content (9)

5.14.1 Profile5.14.2 Cockpit Electronics Product Line5.14.3 Innovative HMI Designs

Chapter 6 Global Vehicle Display Panel Suppliers

6.1 JDI

- 6.1.1 Profile
- 6.1.2 Vehicle Display Business Layout
- 6.1.3: LTPS LCD Technology Layout
- 6.1.4 New-generation Panel Technology (1)
- 6.1.5 New-generation Panel Technology (2)
- 6.1.6 Innovative Vehicle Display Designs (1)
- 6.1.7 Innovative Vehicle Display Designs (2)
- 6.1.8 Innovative Vehicle Display Designs (3)

6.2 LGD

- 6.2.1 Profile
- 6.2.2 Vehicle Display Business Layout
- 6.2.3 New-generation Vehicle Display Technology (1)
- 6.2.4 New-generation Vehicle Display Technology (2)
- 6.2.5 Vehicle Display Solutions for Each Phase of SDV (1)
- 6.2.6 Vehicle Display Solutions for Each Phase of SDV (2)
- 6.2.7 Vehicle Display Solutions for Each Phase of SDV (3)
- 6.2.8 Innovative Vehicle Display Designs (1)
- 6.2.9 Innovative Vehicle Display Designs (2)

6.3 Tianma Microelectronics6.3.1 Profile6.3.2 Vehicle Display Business Layout

- 6.3.3 Innovative Vehicle Display Designs (1)
 6.3.4 Innovative Vehicle Display Designs (2)
 6.3.5 Innovative Vehicle Display Designs (3)
 6.3.6 Innovative Vehicle Display Technology
 6.3.7 New-generation Vehicle Display Technology (1)
 6.3.8 New-generation Vehicle Display Technology (2)
 6.3.9 New-generation Vehicle Display Technology (3)
 6.3.10 New-generation Vehicle Display Technology (4)
- 6.4 BOE
- 6.4.1 Profile
- 6.4.2 Vehicle Display Business
- 6.4.3 BOE Varitronix's Panel Technologies (1)
- 6.4.4 BOE Varitronix's Panel Technologies (2)
- 6.4.5 BOE Varitronix's Panel Technologies (3)
- 6.4.6 BOE Varitronix's Panel Technologies (4)
- 6.4.7 BOE Varitronix's Panel Technologies (5)
- 6.4.8 BOE Varitronix's Panel Technologies (6)
- 6.4.9 Innovative Vehicle Display Technologies and Products (1)
- 6.4.10 Innovative Vehicle Display Technologies and Products (2)
- 6.4.11 Innovative Vehicle Display Technologies and Products (3)
- 6.4.12 Intelligent Cabin Display Solution
- 6.4.13 Innovative Vehicle Display Designs (1)
- 6.4.14 Innovative Vehicle Display Designs (2)
- 6.4.15 Innovative Vehicle Display Designs (3)
- 6.4.16 Innovative Vehicle Display Designs (4)
- 6.4.17 Innovative Vehicle Display Designs (5)
- 6.4.18 Innovative Vehicle Display Mass Production Cases (1)
- 6.4.19 Innovative Vehicle Display Mass Production Cases (2)



Table of Content (10)

- 6.4.20 Innovative Vehicle Display Mass Production Cases (3)
- 6.4.21 Innovative Vehicle Display Applications (1)
- 6.4.22 Innovative Vehicle Display Applications (2)
- 6.4.23 Innovative Vehicle Display Applications (3)

6.5 AU Optronics

- 6.5.1 Profile
- 6.5.2 Innovative Vehicle Display Solutions and Products (1) 6.5.3 Innovative Vehicle Display Solutions and Products (2)
- 6.5.4 Innovative Vehicle Display Designs
- 6.5.5 Intelligent Cockpit and Advanced Display Solutions (1)
 6.5.6 Intelligent Cockpit and Advanced Display Solutions (2)
 6.5.7 Intelligent Cockpit and Advanced Display Solutions (3)
 6.5.8 Innovative Vehicle Display Mass Production Cases (1)
 6.5.9 Innovative Vehicle Display Mass Production Cases (2)

6.6 Innolux

6.6.1 Profile

- 6.6.2 Operation
- 6.6.3 Vehicle Display Layout
- 6.6.4 Innovative Vehicle Display Solutions and Applications (1)
- 6.6.5 Innovative Vehicle Display Solutions and Applications (2)
- 6.6.6 Innovative Vehicle Display Designs (1)
- 6.6.7 Innovative Vehicle Display Designs (2)

6.7 Visionox

- 6.7.1 Profile
- 6.7.2 Vehicle Display Business Layout
- 6.7.3 Innovative Vehicle Display Technology



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20

- 6.7.4 Automotive Flexible AMOLED Solutions (1)
- 6.7.5 Automotive Flexible AMOLED Solutions (2)
- 6.7.6 Automotive Flexible AMOLED Solutions (3)
- 6.7.7 Automotive Flexible AMOLED Solutions (4)
- 6.7.8 Automotive Flexible AMOLED Solutions (5)

6.8 TCL CSOT

- 6.8.1 Profile
- 6.8.2 Vehicle Display Production Bases and Production Line Layout
- 6.8.3 Vehicle Display Business Layout
- 6.8.4 Innovative Vehicle Display Solutions and Applications
- 6.8.5 Innovative Vehicle Display Technology
- 6.8.6 Cockpit Display Solution with Compound Functions
- 6.8.7 Innovative Vehicle Display Designs
- 6.8.8 Innovative Vehicle Display Mass Production Cases

6.9 Others

6.9.1 HKC's Innovative Vehicle Display Products 6.9.2 Mantix's Innovative Vehicle Display Products



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