

AOT

**Advanced Optoelectronic
Technology Inc.**

**Investor's Conference
(Code : 3437TT)**

2023/11/22

Safe Harbor Notice

This presentation may contain various forward-looking statements of Advanced Optoelectronic Technology Inc. (“AOT”) and include AOT’s operations, future results and prospects. These statements may involve substantial known and unknown risks and uncertainties, and actual result and performance may differ materially from those contained in any forward-looking statements due to some factors beyond AOT’s control. In addition, AOT expressly disclaims any obligation or undertaking to release publicly any updates or revisions to any forward-looking statements, whether as a result of new information, future events, or otherwise.

Outline

- **Corporate Introduce**
- **Operation Results**
- **Market Outlook**
- **Business Strategy**

1. Corporate Introduce

Basic Information

- **Set-up : 1999/10**
- **President & CEO : Jung-Hsi Fang**
- **General Manager : Yu-Liang Huang**
- **Capital : NT\$1.45 billions**
- **Major Business : Packaging**
- **Employee : around 800**
- **Site : Hsinchu Industrial Park**
- **Oversea office : Shenzhen, China**

Products Trend



Backlight

- TV
- Automotive
- Monitor
- Mobile



Mini LED

- Gaming monitor
- Notebook
- Automotive



Car Lighting

- Front Lamp
- Side Lamp
- Fog Lamp
- Rear Lamp



New Pro

- AR/VR
- Light Sensor
- Bio Sensor
- UV LED
- Photo Coupler

Major Customers

INNOLUX

SHARP

SAMSUNG

BOE

TIANMA

 **LG Display**

 **Microsoft**

vivo

oppo

VIZIO

GARMIN





lenovo 联想

TCL

华星光电
CSOT



Hisense

available at
amazon

2.Operation Results

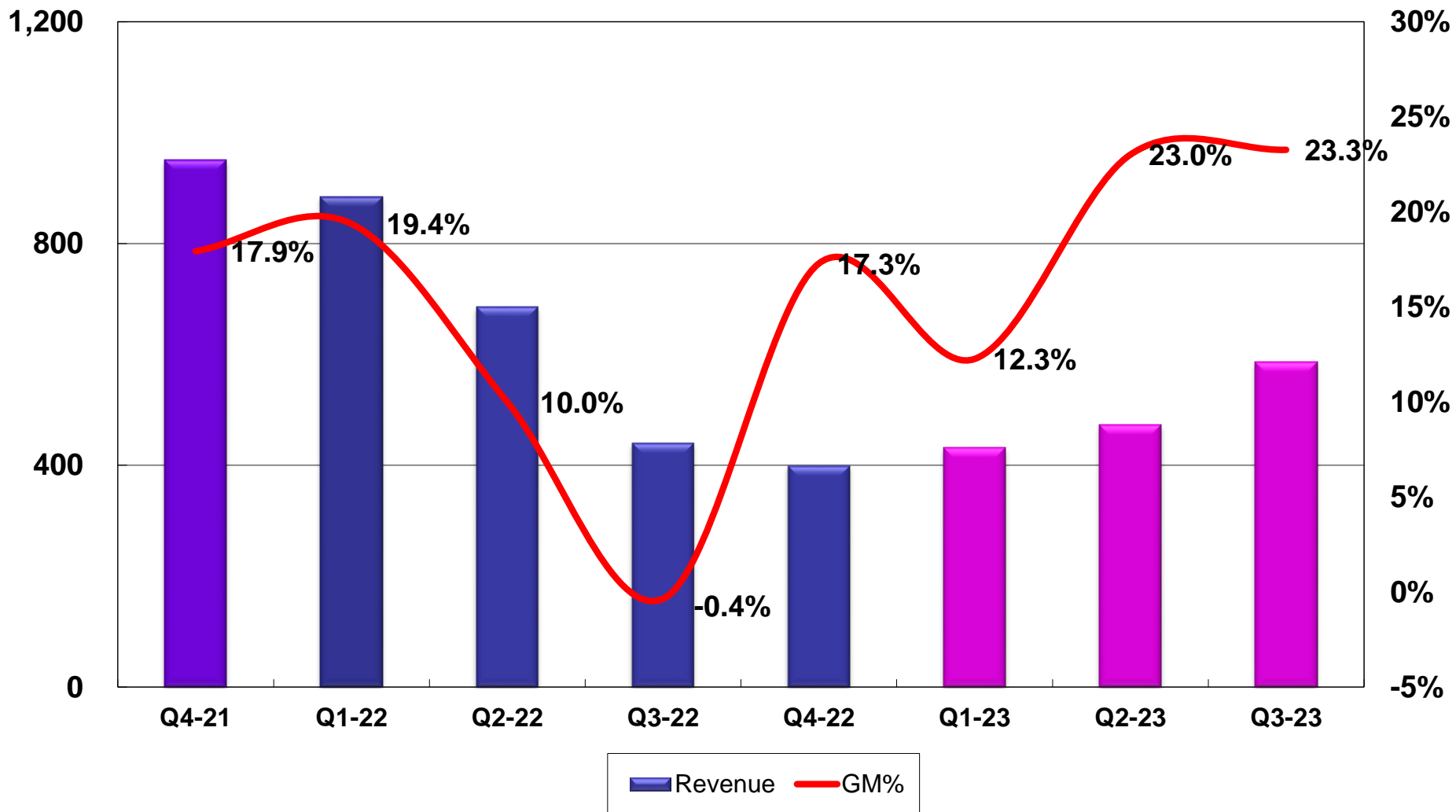
Financial Results

UNIT:NT\$K

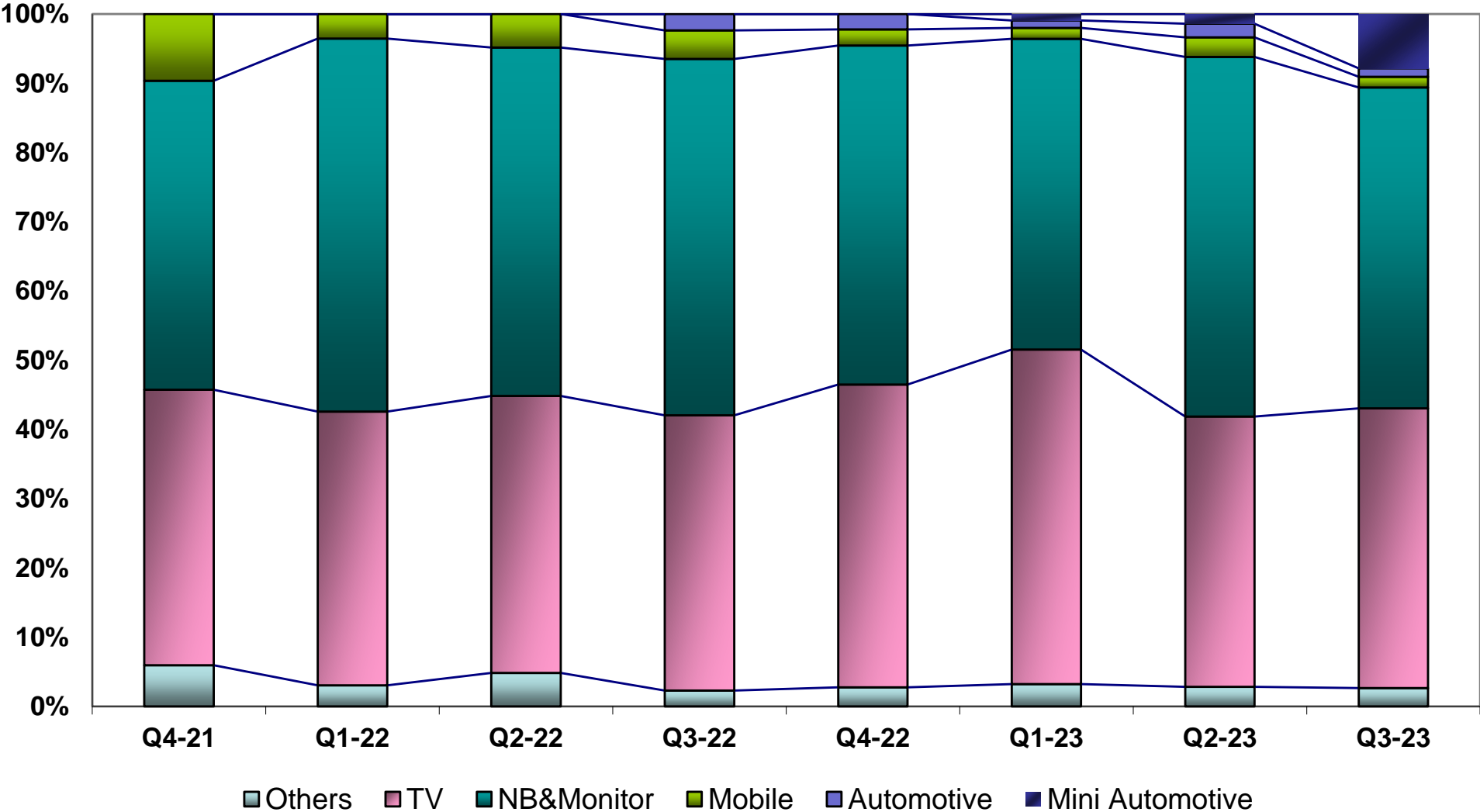
Year	2017	2018	2019	2020	2021	2022
Revenue	5,978,055	4,643,051	4,037,141	5,478,884	4,396,109	2,410,672
Gross Margin	770,076	279,198	356,091	381,694	622,121	307,368
Gross Margin%	12.88%	6.01%	8.82%	6.97%	14.15%	12.75%
Operation Income	132,039	(395,227)	(171,061)	(106,663)	61,118	(172,812)
Net Income after Tax	98,008	(386,785)	(207,225)	(110,627)	88,311	(142,246)
Net Income after Tax%	1.64%	(8.33%)	(5.13%)	(2.02%)	2.01%	(5.90%)
EPS(NT\$)	0.68	(2.68)	(1.43)	(0.77)	0.61	(0.98)

Quarterly Revenue & GM%

UNIT:NT\$ Million



Product Portfolio



3. Market Outlook

2024 LED Display Market Outlook



Display for vehicle

With the vigorous development of the EV market, the demand for panels for vehicles has passed the depression. In terms of design, end customers who used the traditional encapsulation mode start to use Flip-chip products and POB to respond to the development of diversified products.

Micro LED

The development of Micro LED used in head-mounted AR penetrating smart glasses, wearable smart watches, automotive smart cockpits and transparent display products is expected to stimulate the birth of high-end Micro LED application products.

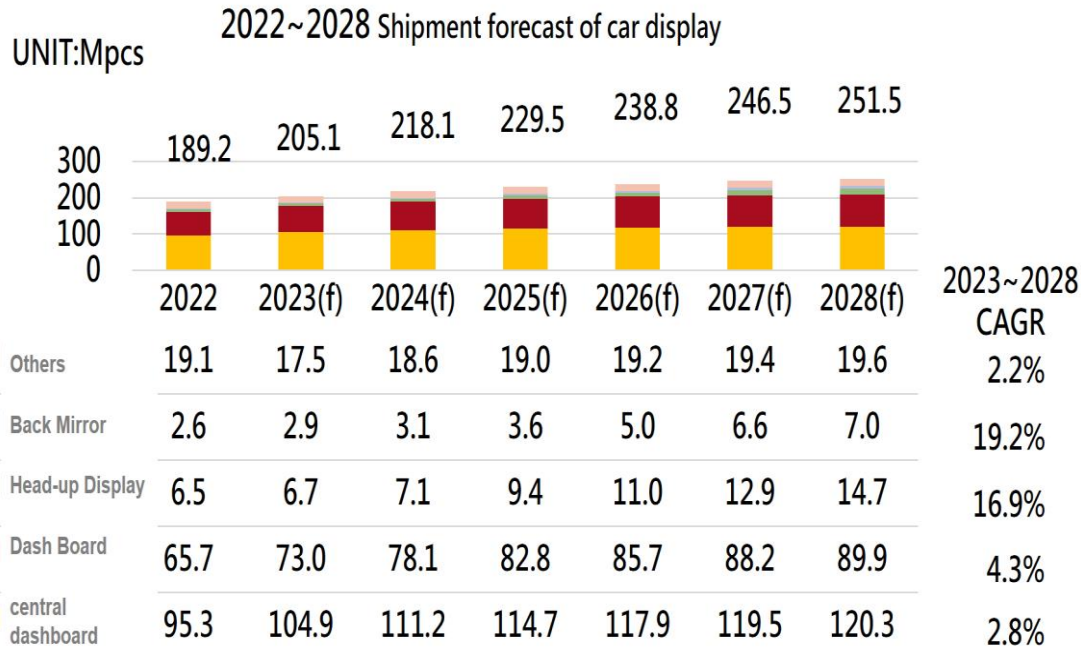
Mini LED

Mini LED backlight display applications have gradually matured, and have significant advantages in brightness, reliability and other performances. They have the opportunity to enter the high-end display market, such as high-end IT products, TVs, automotive panels, and indoor and outdoor displays.

Smart Home

5G combined with IoT drives smart home applications, including robots/intelligent audio-visuals/smart home appliances and other special application display devices. The demand for display devices has grown increasing

Market Trend of display for vehicles



➤ According to market research agencies, automotive display shipments are estimated to have a CAGR of 4.2% from 2023 to 2028, and global automotive displays are still in a growing trend.

➤ In addition to the application in traditional vehicle series, the application in EVs is also one of the key factors of this trend.

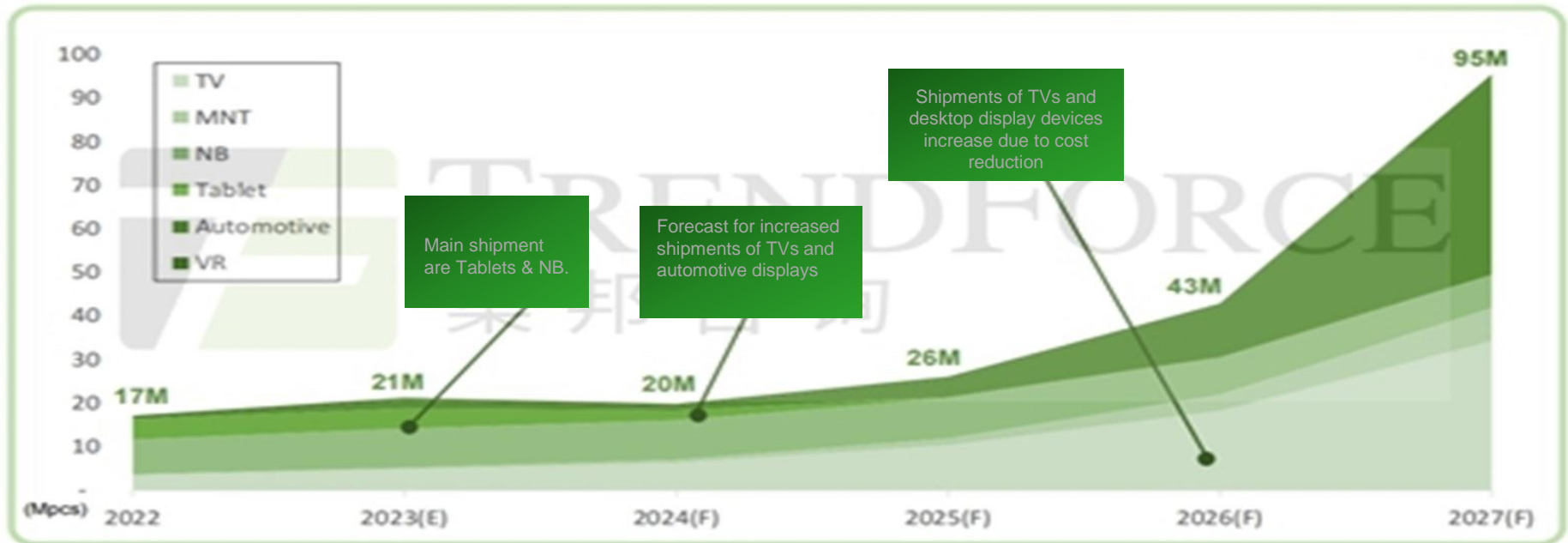
➤ Among them, the demands for back mirrors and head-up displays increased the fastest. Manufacturers also successively developed related products of LCD. Therefore, LED will be more widely used in increasing the safety coefficient when driving.

3 Source : DIGITIMES Research · 2023/9



Market Trend of display for Mini LED

- In 2023, the shipment volume of Mini LED backlight application products will increase from about 17 million units in 2022 to about 21 million units. However, it needs to be acknowledged that iPad and MacBook of Apple have a great impact on the direction of the entire market. Considering that Apple is likely to switch from Mini LED to OLED, TrendForce predicts that the shipment volume of Mini LED backlight application products will decline in 2024. However, this will only be a turbulent phenomenon in the short term. After 2024~2025, as costs decrease, more brands will introduce Mini LED, and the shipment volume is expected to reach 75 million units in 2027

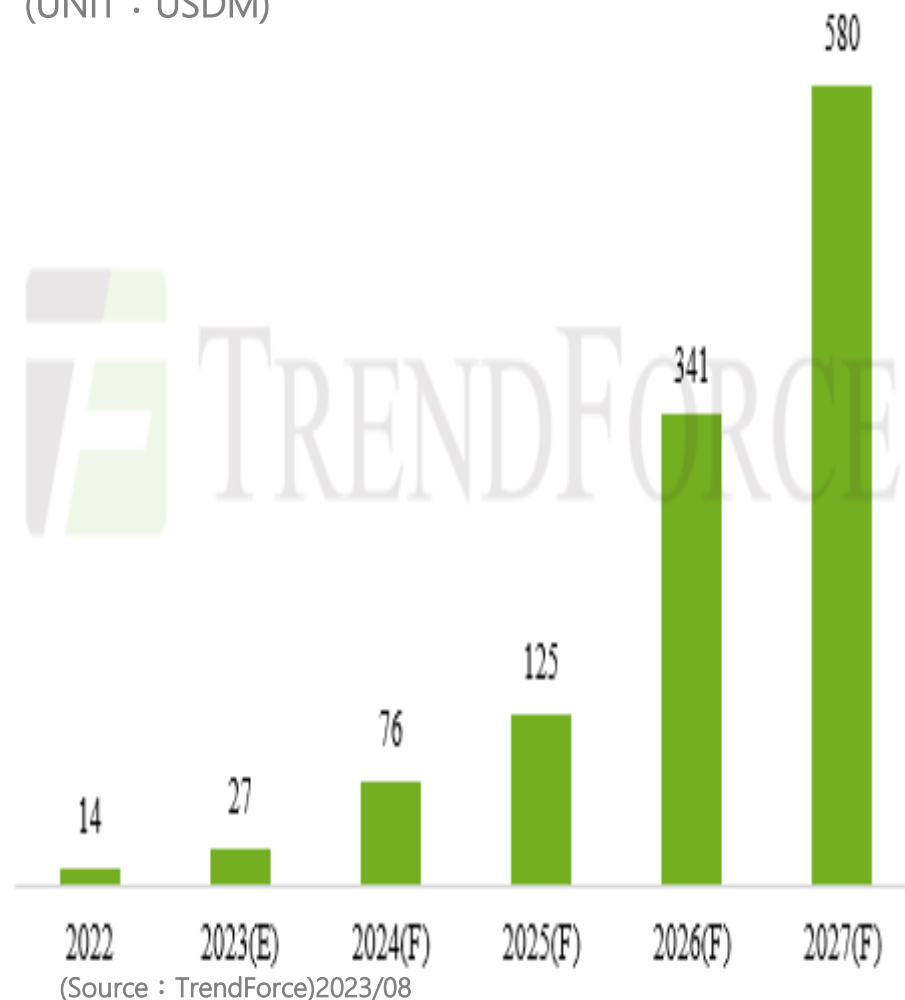


Source : Trendforce:2023/03

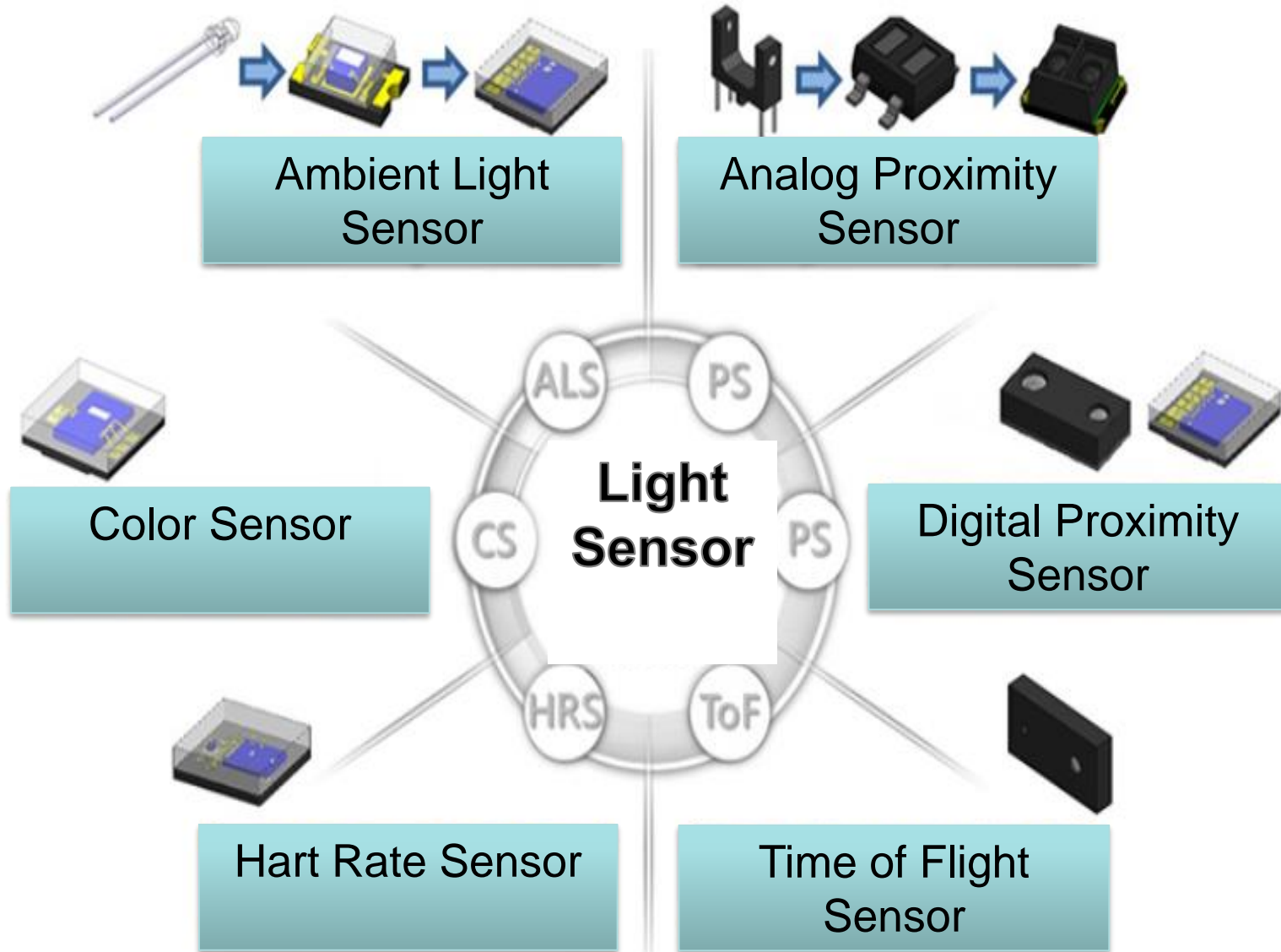
Market Trend of Micro LED

- According to the research from TrendForce, the output value of Micro LED chips is estimated to be approximately US\$580 million in 2027, and the compound growth rate (CAGR) from 2022 to 2027 is estimated to be approximately 136%.
- In AR head-mounted devices, Micro LED has better-than-average balanced performance in terms of brightness, energy consumption, pixel density (Pixel per Inch, PPI), and optical machine size. Industry leaders, such as Meta, Google, and The Massachusetts Institute of Technology (MIT), etc., continue to evaluate and assist in the development of Micro LED in the micro-projection display market.

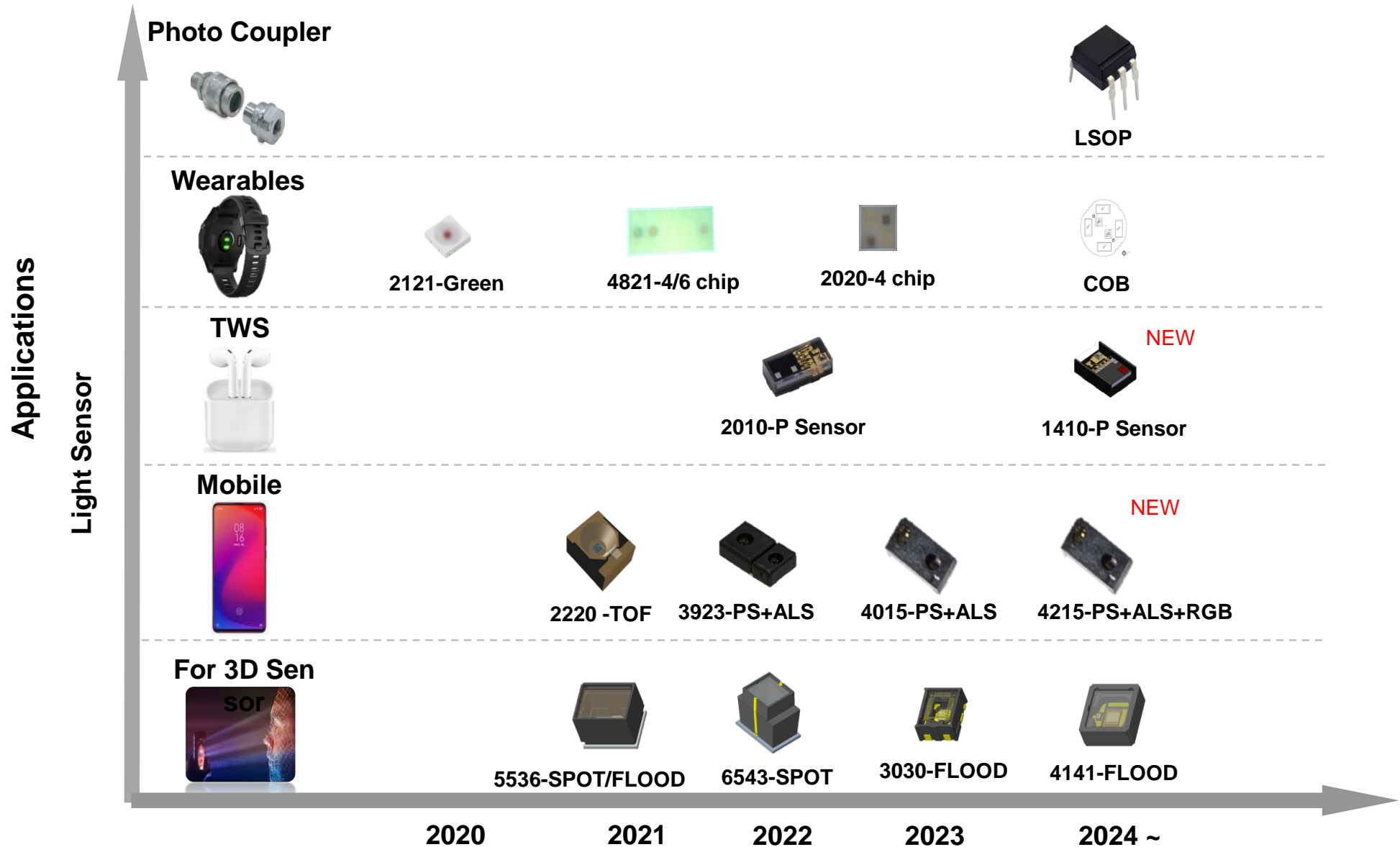
2022~2027 Micro LED CHIP Value
(UNIT : USDM)



Light Sensor Application



Sensor Product line





Sensor Market Strategy Analysis

全球和中国智能手机出货量、增长率，2023-2027



The mobile phone market will continue to decline in 2023 and is expected to reverse in 2024, with an annual growth of 5.9%.

Global Light Sensors Market Market Size



Source: Mordor Intelligence

Study Period	2018 - 2028
Base Year For Estimation	2022
CAGR	9.10%
Fastest Growing Market	Asia Pacific
Largest Market	North America
Market Concentration	Low
Major Players	

*Disclaimer: Major Players sorted in no particular order

The output value of the sensor market will continue to grow in the next ten years, with a CAGR of 9.1%.

Light Sensor

- Proximity Sensor
- Ambient Light Sensor
- Color Sensor
- Flicker Sensor

Image Sensor (CIS)

- Selfie Camera
- Main Camera

Bio Sensor

- Heart Rate
- Oximetry
- Blood Pressure
- Glucose Sensor

3D Sensor

- AR Distance Sensor
- Sensor
- Face ID

P-Sensor

G-Sensor

Fingerprint Sensor

GPS

Gyro Sensor



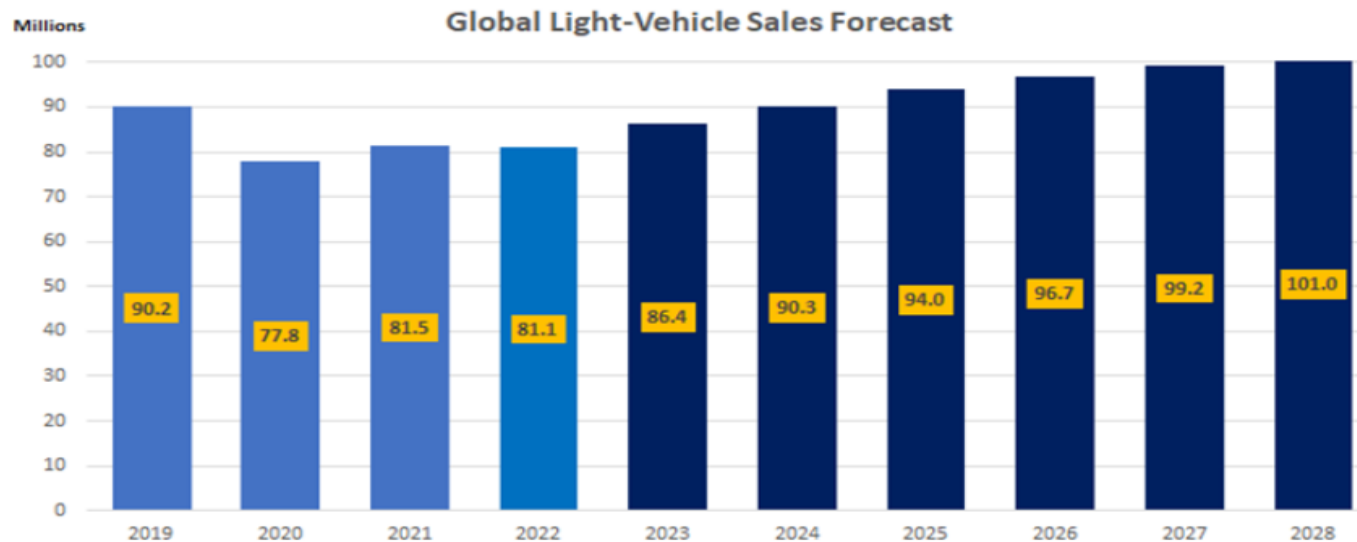
Sensor market analysis

Among consumer market products, smart phones account for the largest share of output value. As mobile phone manufacturers of various brands have increasing requirements for user experience, the number and output value of sensors placed in mobile phones are also increasing year by year. Currently, product lines among mobile phone sensors, such as Light Sensor/Bio Sensor are highly process-related products for the company's horizontal product development strategy, and are the main force for the future development of sensing products.

4. Business Strategy

Global Automotive Market Analysis

In the first half of 2023, the impact of the severe infectious pneumonia (COVID-19) epidemic has not yet vanished, and then it faced new challenges such as the Russia-Ukraine war, rising inflation and interest rates. Automakers encountered shortages, chain interruptions, rising costs, and limited production capacity, and effect the deliver date of new cars. Fortunately, the global automotive market gradually get rid of the impact of the epidemic in the second half of the year, and the shortage of parts and components has been eased. It's estimated that 86 million vehicles will be sold in 2023.



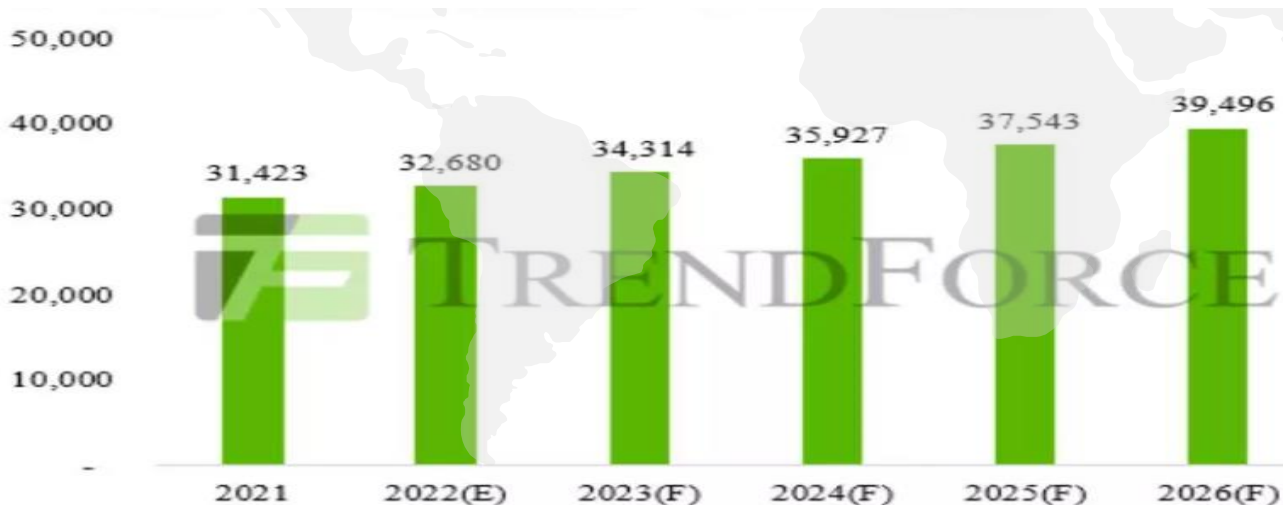
Source: WardsIntelligence/GlobalData.

LED Output Value in Automotive Market

In 2023, the automotive demand was dropped due to the war and COVID-19. However, as the increasing penetration rate of LED headlights and the development of ADB headlights, logo lamps and smart ambient lights, the demand of automotive lighting market still keeps steady in 2023.

The output value of the global automotive lighting market is expected to reach US\$34.31 billion in 2023 with an annual increase of 4%. The top five international automotive lighting manufacturers are: Koito, Valeo, Marelli Automotive Lighting, Hella, and Stanley.

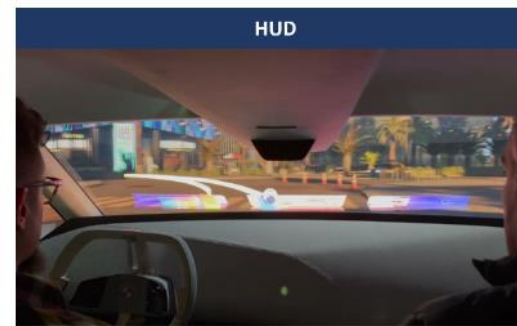
Lighting Output value of global automotive market in 2021-2026 (Unit : USD Million)



Source: TrendForce, Jul., 2022

Application Trends in Vehicles

The global economy is still weak despite the inflation slowdown in Europe and the United States. Car manufacturers decrease the selling price to stimulate consumption. At the same time, it also puts the entire car market into the cycle of price competition. As the auto market enters the cycle of price competition, the price of automotive LEDs has dropped significantly, which has also delayed the development plan of some kind of automotive LED product lines. Advanced technologies such as adaptive headlights (ADB Headlight), Mini LED taillights, Full-Width Taillights, Logo Lamps, and (intelligent) ambient lights are still expected to increase the size of the automotive LED market in 2023 .



Automotive Lighting Business Strategy

Automotive Components Market

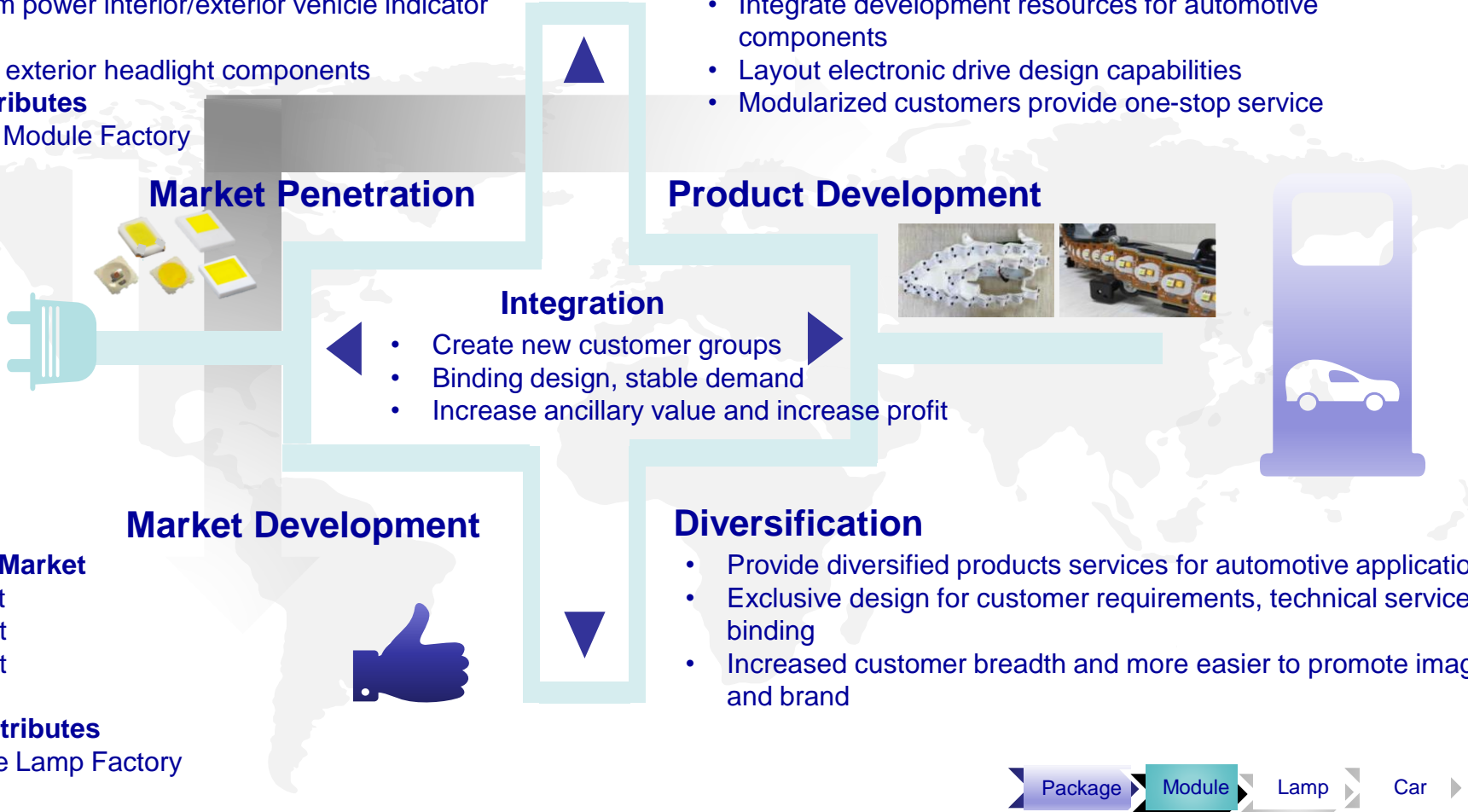
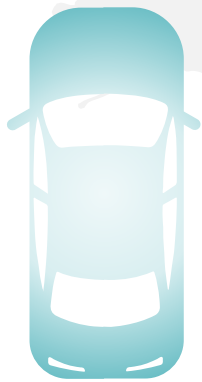
- Low-medium power interior/exterior vehicle indicator application
- High-power exterior headlight components

Customer attributes

- Automotive Module Factory

Automotive module market

- Integrate development resources for automotive components
- Layout electronic drive design capabilities
- Modularized customers provide one-stop service



Application Market

- OE Market
- AM Market
- PM Market

Customer attributes

- Automotive Lamp Factory

VR/AR

Key Component

Vertical Integration

Innovation

Roadmap

2023

2024

2025

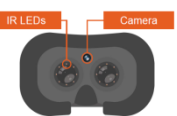
2026

2027

2028

Eye Tricker

VR



VCSEL → LED
Plan for MP line

AR

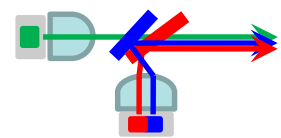
Illum Module

VR

Mini-LED

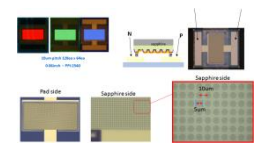
AR

2000nits/1.2CC → 2000nits/0.7CC → 3000nits/0.3CC



MicroLED Display

1st EC prototype → 2nd EC prototype
Transmittance 15-80% <3s
Plan for EC&LC MP line
1st prototype size 5 → 2st prototype size <3um



Thanks!

Q & A