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ICV: Onsemi and OmniVision's Global Automotive CIS Market Share to Increase Further in 2021

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As vehicles evolve from Advanced Driver Assistance Systems (ADAS) to fully autonomy, one of the key technologies is advanced image sensors to empower vehicles to sense the world around them.

Due to weak demand in the global automotive market in 2020 and the impact of less-than-expected production schedules of principle car manufacturers, major car manufacturers worldwide are experiencing low stock availability in 2021. The most obvious impact on capacity is automotive semiconductors, with 12-inch automotive CIS and MCU already the most severe shortage of automotive semiconductors in 2021.

In 2021, as the number and penetration of Level 2 smart driving vehicles climbs, it drove the number of in-vehicle cameras to grow rapidly as well. According to ICV's "Global intelligent driving forecast-2022" report, the global penetration rate of L2 or above vehicles reaches 28.62% (19,529,400 vehicles) in 2021, which have an 80.34% increase from 2000. When each Level 2 passenger vehicle can be equipped with an average of 5 cameras, the Level 2 passenger vehicles are fitted with 97,347,000 cameras. Based on a single monocular camera requiring one CIS, a binocular camera requiring two, and a trinocular camera requiring three, the total global CIS allocation in 2021 will be 164 million and it is expected to be 370 million in 2026.

Number of factory-installed in-vehicle CIS forecast (Million)-World 2022-2026

（Source：Global automotive camera market forecast-2022）

*1 Binocular camera is calculated as 2 cameras

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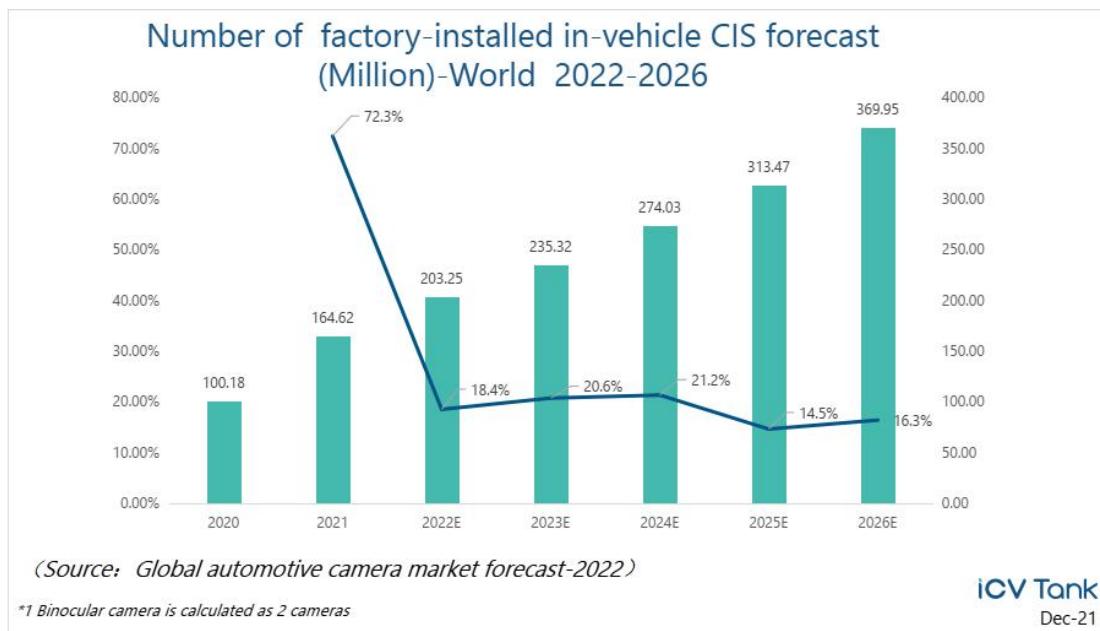
There are some changes in the performance quality requirements of in-vehicle cameras along with the intelligent driving level. For example, L1 passenger vehicles are only configured with an average of two cameras with basic performance requirements of display grade and less than 2 million pixels. However, for L2 passenger cars, two out of five cameras must have ADAS function on average, and the unit price is more than double that of the display function. Similarly, full autonomy cameras are required in terms of L4 and L5, and the unit price increases. The improvement of camera performance depends on the progress of CIS performance. For instance, Onsemi is actively developing high HDR and 8+ megapixel CIS products, which are more expensive than other lower grade products.

According to ICV, the total value of global in-vehicle CIS in 2021 is $3.81 billion.

Factory-installed in-vehicle cameras and CIS must meet vehicle-grade product performance requirements and have a much higher market value than the post-factory installation market. The total value of the factory-installed in-vehicle CIS market is $3.14 billion in 2021, compared to $670 million for post-factory installation CIS, and the unit price of post-factory installation CIS is almost half that of factory-installed. Despite the impact of the global in-vehicle semiconductor capacity crunch, the overall market value is driven by higher prices for in-vehicle CIS. According to ICV's market statistics for 2021, the market is estimated to be 4.3% higher compared to 2020.

(Source：Global automotive camera market forecast-2022）
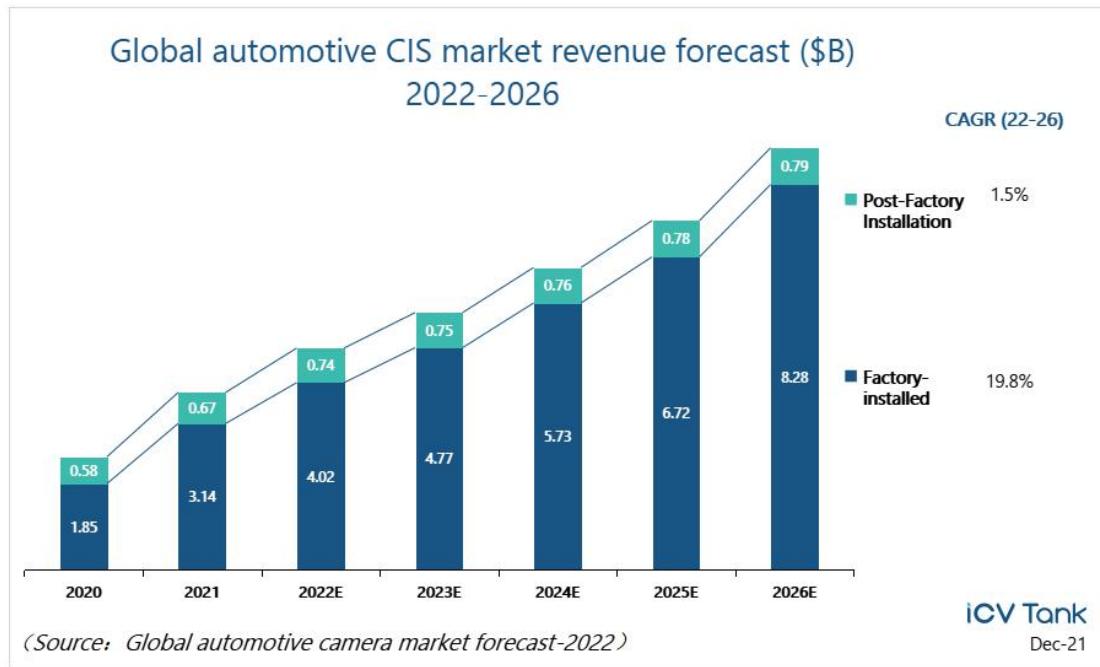
There is a technology trend for High Dynamic Range (HDR) to be used as an image sensor for autonomous driving. It serves as a key parameter for image

sensors that can well simulate the human eye which has a strong ability to adapt to different lighting conditions. HDR ensures that the image sensor can see between the darkest and brightest parts of the same image frame and does not exceed or fall below saturation. In other words, the image sensor must be unaffected by ambient lighting conditions, such as sudden exposure to bright sunlight/reflections or getting in and out of tunnels in daylight.

Another technology trend in image sensors used for autonomous driving is high resolution. Self-driving cars need to see further and detect objects of all kinds of sizes. Essentially, high-resolution image sensors increase the number of pixels per degree, thereby making self-driven algorithms more effective with both target detection and classification.

In 2021, the global in-vehicle CIS market concentration is further rose due to a trapped capacity shortage. Onsemi and OmniVision, two powerhouses, increased their market share to a combined 74%.

Market landscape of global factory-installed in-vehicle CIS market -by final Sales revenue($B)- 2021

- onsemi
- OmniVision
- pixelplus
- sony
- others

0.54
17%

0.20
6%

0.10
3%

1.40
45%

0.90
29%
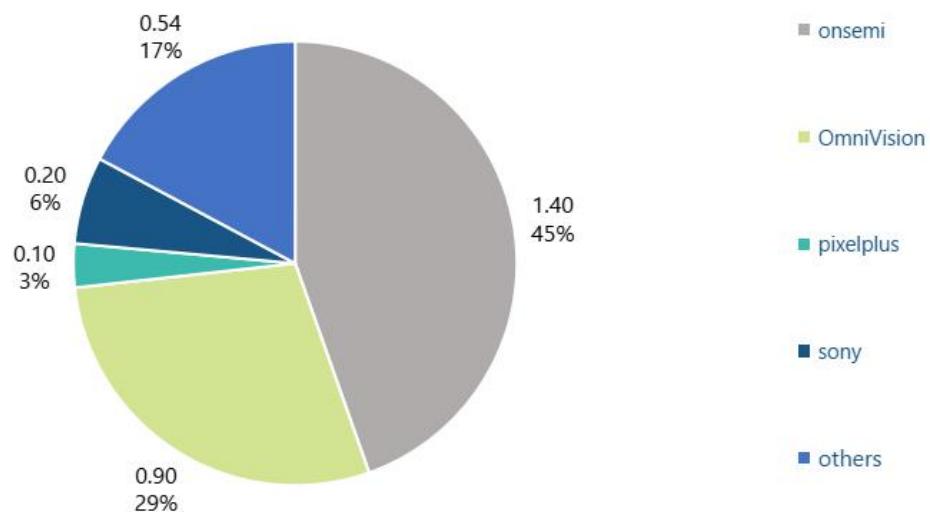
（Source：Global automotive camera market forecast-2022）

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