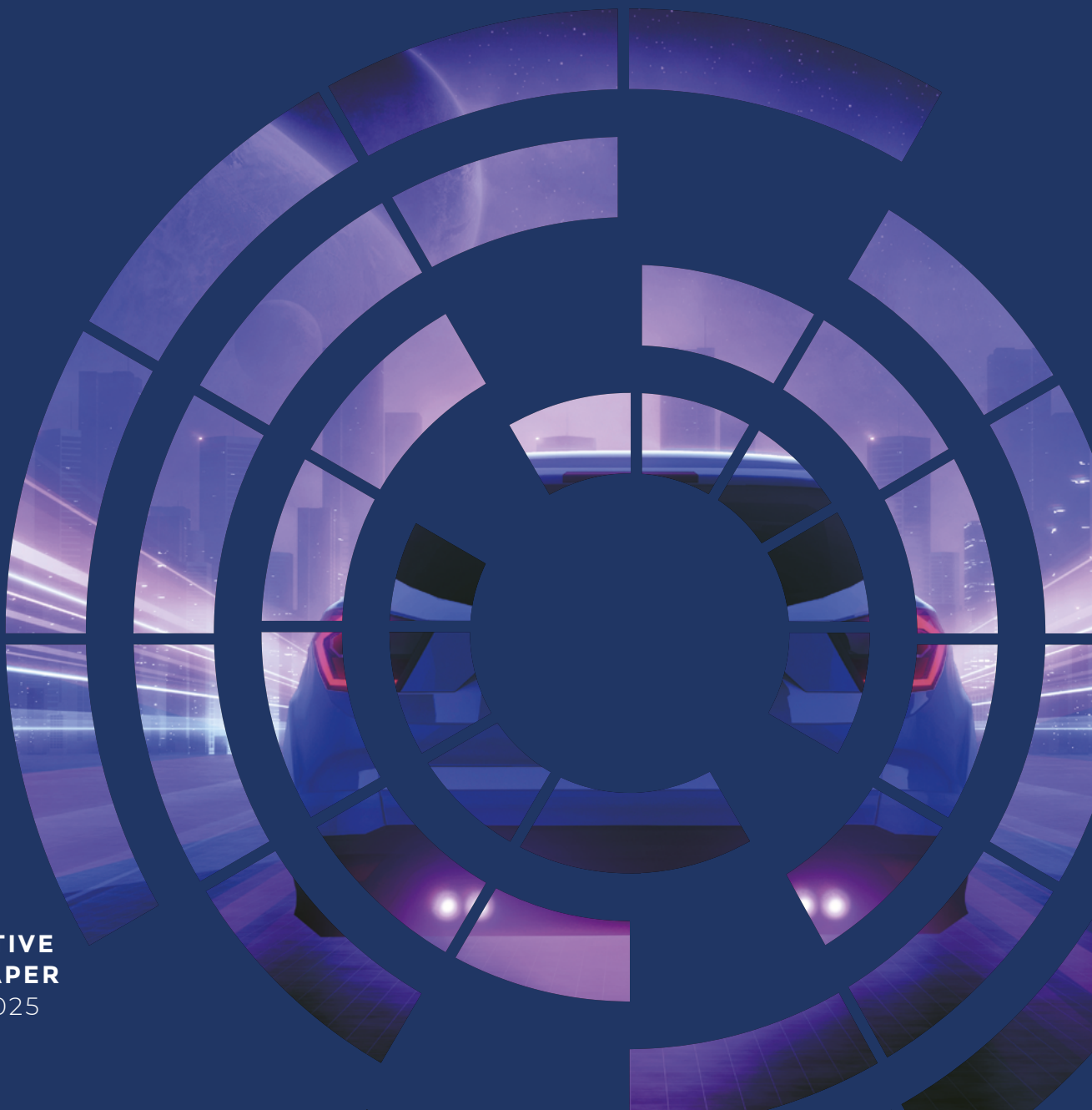
YOLE Group

SHIFTING GEARS: SEMICONDUCTORS AT THE HEART OF AUTOMOTIVE'S NEXT CHAPTER

HOW ELECTRIFICATION, ADAS, AND DIGITALIZATION ARE RESHAPING LEADERSHIP IN AUTOMOTIVE SEMICONDUCTORS.



AUTOMOTIVE WHITE PAPER
VOL.2 / 2025

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Semiconductor supply chains, strategies, and the road ahead

The automotive industry is undergoing a profound transformation. Electrification, autonomous driving, and the rise of software-defined vehicles are reshaping not only the car itself but the entire value chain behind it. At the very heart of this revolution lies the semiconductor—now a strategic enabler of performance, innovation, and differentiation in a fiercely competitive market.

Leading semiconductor firms are repositioning in response to this complexity. Closer integration with OEMs and Tier 1 suppliers is becoming essential. Supply chain dynamics, including geographic diversification, capacity pressures, and new partnership models, are redefining the way chipmakers engage with their automotive customers, as they make increasingly direct links with OEMs at multiple levels of their supply chains.

This shifting landscape raises critical questions.

- How will semiconductor innovation determine future market control?
- How are leading players adapting their strategies in the face of intensifying Chinese competition, with more and more innovations coming from Chinese OEMs?
- And, ultimately, what will the future of the automotive semiconductor supply chain look like?

At Yole Group, we bring unique visibility into these dynamics thanks to our reverse engineering and costing activities. Through deep teardown analyses of automotive modules and semiconductor devices, we uncover OEM and chipmaker technology choices and track innovation at the component, module, and system levels. We understand how these decisions translate into market strategy and competitive positioning. This capability is the core of our mission: linking technology, supply chains, and business strategy.

These insights form the backbone of Yole Group's Automotive White Paper, Volume 2. In this edition, we analyze the strategies of the global leaders, the evolving role of the Chinese ecosystem, and the technologies that are setting the pace in the race for automotive silicon leadership.

We are pleased to present this second edition as part of our Automotive White Paper series, an ongoing collection dedicated to providing significant and relevant insights into one of the most strategic markets of our time.

Stay tuned for upcoming volumes.



JEAN-CHRISTOPHE ELOY
Founder & President,
YOLE GROUP

01

THE TECHNOLOGY EVOLUTION BEHIND THE WHEEL

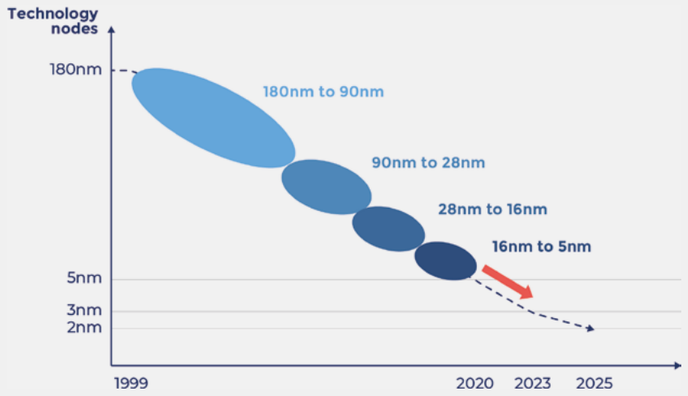
HOW NEXT-GEN CAR DESIGN IS FUELING THE CHIP BOOM.

The evolution of semiconductor process nodes from 180 nanometer (nm) to below 5nm marks a dramatic leap in performance, power efficiency and integration density.

- Initially **180nm to 90nm nodes** dominated automotive applications. This range now captures the most mature nodes, used for cost-sensitive, low-performance automotive applications like basic control and sensors. As consumer demand pushed for more advanced features, chipmakers began migrating toward more advanced nodes. The 90nm to 28nm range includes mature nodes that are widely used for mid-range automotive applications such as infotainment, gateways and basic ADAS
- The **28nm to 16nm range** represents a transition from planar transistors (28nm, 20nm) to FinFET technology (16nm). These nodes are used for more performance-oriented applications like mid-to-high-end ADAS and infotainment.
- The **16nm to 5nm range** includes advanced nodes providing higher compute performance used for high-performance ADAS and autonomous driving.

Below 5nm represents the next generation of advanced automotive semiconductors. **The first sub 5nm devices, pioneered by foundries like TSMC and Samsung, have already hit the market, with 3nm nodes coming in the second half of 2026**, enabling advanced eyes-off applications.

Technology nodes for automotive devices - Introduction year*

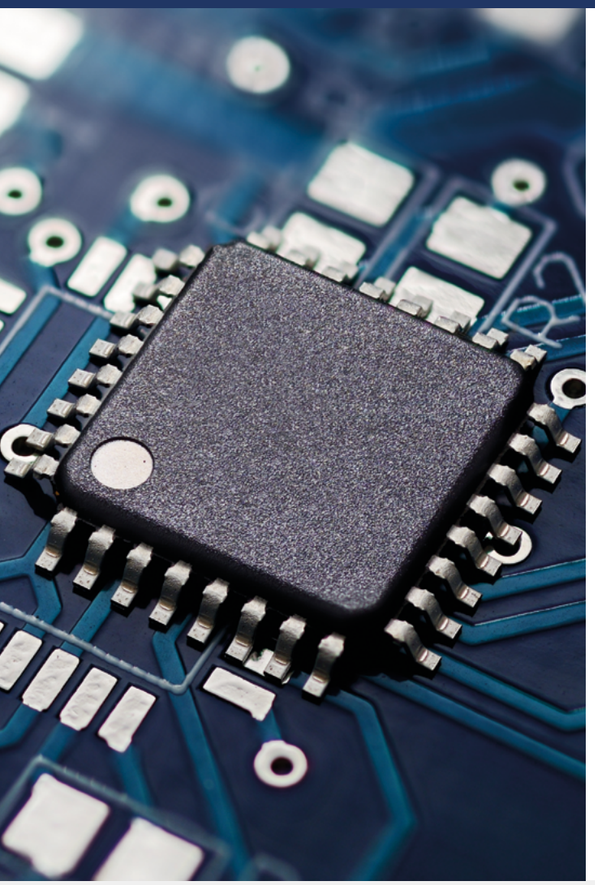


* Year of first introduction



This evolution in process nodes has directly influenced the strategic positioning of major semiconductor players in the automotive market.

These will initially be limited to small volumes for premium vehicles, as the cost is higher than for more mature nodes, and could also be used for central compute or premium infotainment, where designs are trending towards pillar-to-pillar 8k high resolution displays requiring high-performance SoCs with GPU cores to display content.





PIERRICK BOULAY
Principal Analyst,
Automotive Semiconductors at Yole Group

“To stay competitive, many players are adopting hybrid strategies, developing advanced-node silicon for centralized computing while maintaining legacy node portfolios for distributed architectures.”

This dual approach reflects the diverse needs of automotive OEMs and the growing importance of node selection for differentiation, scalability, and long-term supply chain resilience.

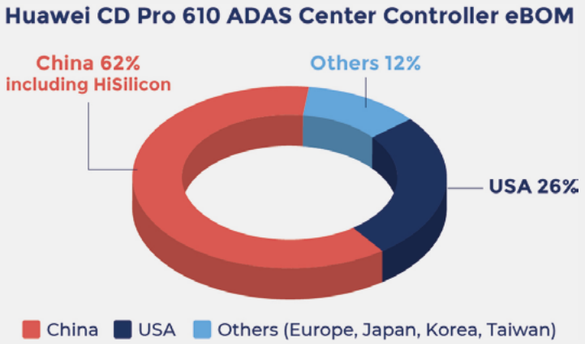
Technology nodes - Automotive devices

	Applications
180nm to 90nm	Cost-sensitive, low-performance automotive applications like basic control and sensors.
90nm to 28nm	Mid-range automotive applications such as infotainment, gateways, and basic ADAS.
28nm to 16nm	More performance-oriented applications like mid-to-high-end ADAS and infotainment.
16nm to 5nm	High-performance automotive applications for ADAS and autonomous driving.
Below 5nm	First devices expected around 2026-2027. Advanced eyes-off applications and for limited to premium vehicles. Also central compute or premium infotainment with very high-resolution displays.

ADAS computing - Chinese players manufacture their own chips

Example: Huawei MDC Pro 610 ADAS Center Controller for Changan Avatr 11





SEEING THE FUTURE: HOW LIDAR IS SHAPING INNOVATION

LiDAR systems, once considered prohibitively expensive, are now being integrated into more vehicles thanks to advancements in chip design, manufacturing scalability and innovation.

LiDAR is emerging as an essential component in ADAS for achieving a high level of autonomous driving performance.

All robotaxis, trucks and shuttles are equipped with LiDAR, and leading US robotaxi companies Cruise and Waymo already manufacture their own chips.

All robotic taxis, trucks and shuttles are equipped with LiDAR, and leading US robotaxi companies Cruise and Waymo already manufacture their own chips.

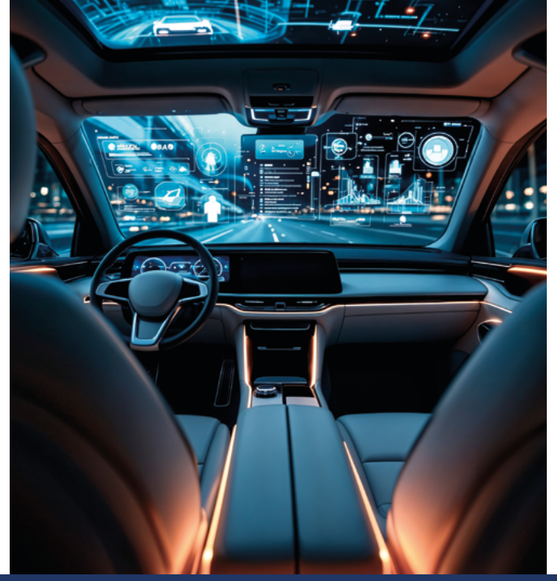
LiDAR technology requires too much computing power to be centralized on current platforms. But as discussed in the Automotive White Paper, Vol.1 , electrification has become so ubiquitous in China, where EV adoption has surged, that automakers are turning to new technologies like LiDAR to differentiate their offerings and gain strategic advantage.



WILFRIED THERON
Electronic Systems Teardowns Director at Yole Group

“Chinese companies such as NIO and Huawei-backed Avatr are increasingly embedding LiDAR in their models to enhance their ADAS and autonomous driving capabilities, positioning it as a premium yet accessible feature.”

For semiconductor firms, this trend creates a growing demand for specialized components.



02

WHO'S WINNING THE AUTOMOTIVE SILICON RACE?

A new era of mobility is reshuffling the semiconductor leaderboard.

The $68 billion automotive semiconductor market is led by US suppliers, which hold a 36% market share, Yole Group's analysis shows. They are followed closely by European suppliers with a 35% share and Japanese suppliers at 19%.

US players primarily focus on analog devices and leading-edge compute and memory devices. With players like Nvidia, AMD and Qualcomm supplying SoCs made on the most advanced technology nodes, their market share could increase if more of these devices are used in cars.

European players including Infineon Technologies, NXP and STMicroelectronics excel in supplying power discretes, silicon carbide (SiC) modules and microcontroller units (MCUs) on 40-90nm nodes.

Japanese players led by Renesas mainly supply sensors, legacy MCUs and SiC devices. Rohm and Denso are prominent in supplying SiC MOSFETs in particular.



YU YANG
Principal Analyst,
Automotive Semiconductors
at Yole Group

"While South Korea is driven by memory players, China is expected to grow into a major supplier as the Chinese government requires companies to develop local production."

Yole Group observes that leading semiconductor companies are taking distinct strategic approaches to capture value in the automotive market.

As an example, traditional players like Infineon Technologies, NXP, STMicroelectronics, Renesas, and Texas Instruments are investing where they are already leading, doubling down on their strengths to expand their capacity in power electronics, microcontrollers, and analog systems.

Meanwhile, newer entrants and compute-focused firms like Qualcomm and Nvidia are positioning themselves as end-to-end platform providers, offering centralized compute, AI acceleration, and software-defined capabilities through scalable architectures.

Leading semiconductor companies*	Automotive strategy
Infineon Technologies	• Generates revenues mainly from Si/SiC power electronics modules, gate driver ICs, and 40nm MCUs. • It is doubling down on power electronics, expanding SiC capacity.
NXP	• Supplies MCUs and transceivers for networking applications, as well as radar chips for ADAS. • Company that is chasing SDVs.
STMicroelectronics	• Remains focused on power electronics and discrete devices for EVs. • It expects MCUs to be a revenue growth driver beyond the medium term.
Texas Instruments	• Leads in PMICs, sensor interfaces and radar front-ends. • Company that is investing in defending its US analog franchise.
Renesas	• Supplies MCUs for chassis and powertrain applications. • Also pushes ADAS SoCs and chiplet architecture.
Onsemi	• Focuses investment on SiC power devices and image sensors.
Qualcomm	• Breakout climber pursuing ADAS market share with its leading position in cockpit, through domain merging.
Nvidia	• Holds position at the performance apex with the 5nm DRIVE Thor computer and a full AI/AV software stack.
Mobileye	• Current leader in ADAS processors for front cameras, seeking to expand into centralized platforms through a scalable processor approach.
Micron	• Micron Leads the automotive-grade memory race for ADAS, infotainment, and OTA features.

** Non exhaustive list of companies*

How are Chinese suppliers competing in this context?



03
CHINA'S CHIPMAKERS SHIFT GEARS

A STRONG DOMESTIC SUPPLY CHAIN IS TAKING SHAPE. HOWEVER GLOBAL COMPETITIVENESS REMAINS A LONG ROAD.

Semiconductors have long been a focus of the automotive industry in China, even before the COVID-19 related chip shortage. Awareness among key OEMs in China about the importance of security of supply has been reinforced by a push from the Chinese government for self-sufficiency in manufacturing.

The domestic industry in China is emerging in response to the Chinese government's target for 25% of the semiconductors used in cars to be supplied by local companies. The industry is on track to meet this goal and could even reach 100% for certain car models, most likely low-end cars with basic functionalities.

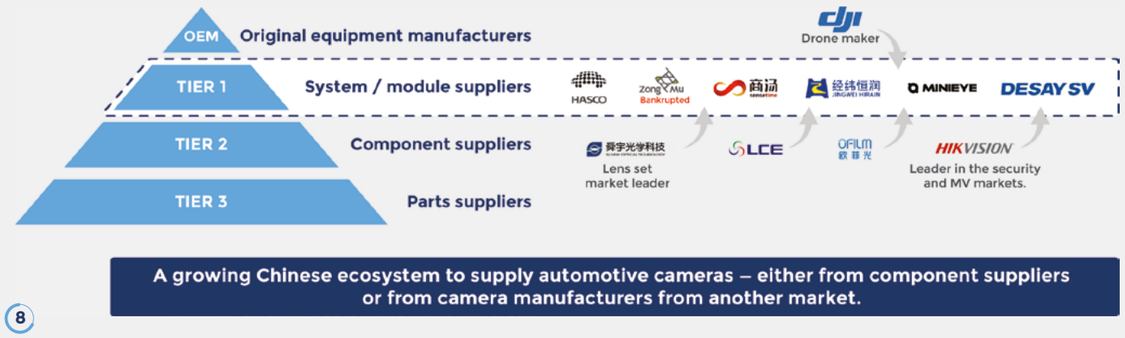


PIERRICK BOULAY
Principal Analyst, Automotive Semiconductors at Yole Group

"Chinese players are still a small part of the global industry. However, Chinese foundries are aggressively investing in 90nm nodes down to 16nm and moving towards 5nm. It will take time for these chips to come to market as they require software development and safety checks."

For Chinese semiconductor companies, the easiest entry point into the automotive market is in producing chips on mature process nodes. It includes power discretes, TVS diodes, CAN/LIN transceivers, and 40nm body MCUs, commonly used in body control modules, lighting systems, security chips, and other non-critical vehicle functions. These chips are typically built on 40nm and older nodes and widely sourced from local suppliers.

A strong Chinese supply chain is in the making*

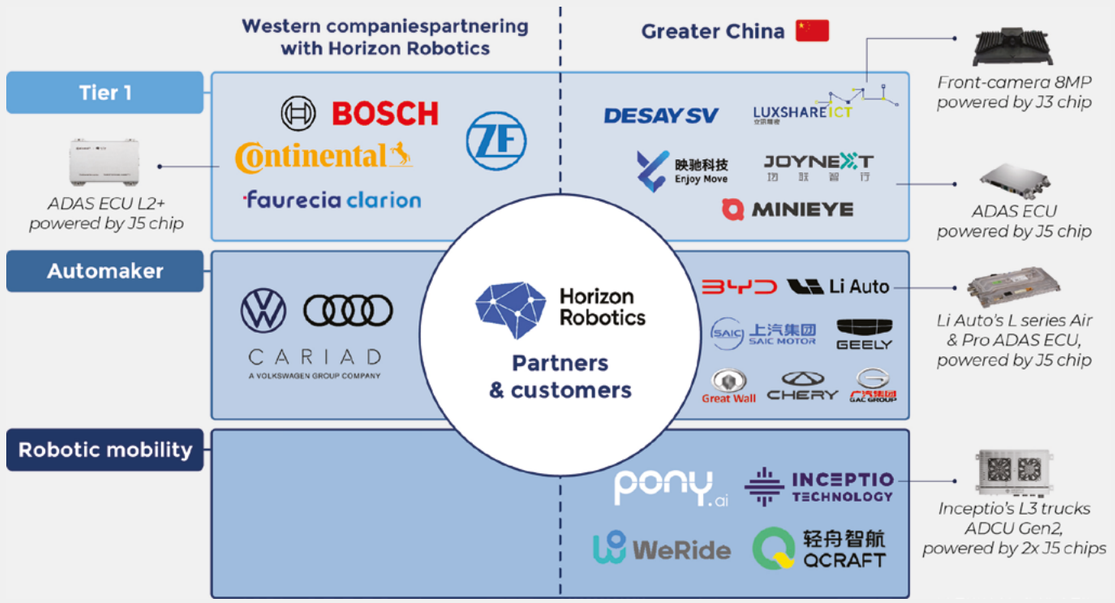


** Non exhaustive list of companies*

The most challenging segment remains advanced-node chips used in high-performance applications like ADAS, infotainment and networking.

Those areas require cutting-edge compute, AI acceleration, and memory bandwidth. These components often rely on sub-10nm nodes, advanced packaging, and proprietary IP, all of which are heavily dependent on overseas equipment and foundries.

China's computing ecosystem - Horizon robotics focus*



** Non exhaustive list of companies*

A step in that direction

- China's Horizon Robotics has already introduced its 7nm Journey 6 family to supply automakers BYD, Changan, and SAIC.
- Carmakers are also moving up the chain to secure supply.

BYD designs its own MCUs, Geely spun out SiEngine to co-develop a 7nm device with Arm, SAIC has a joint venture with SemiDrive, and Nio and XPeng are developing their own SoCs.

CHINA'S ROADBLOCKS TO SELF-RELIANCE

China's efforts to build a self-sufficient automotive semiconductor ecosystem face two major roadblocks that directly limit the country's ability to produce high-performance chips for next-generation vehicles.

- Sub-10nm process capacity

Since 2022, the US has imposed export controls restricting Chinese companies' access to advanced semiconductors and the EUV lithography equipment required to manufacture chips below 10nm. This has significantly limited Chinese foundries' ability to compete at the bleeding edge of chipmaking.

SMIC, China's leading foundry, has been forced to rely heavily on mature DUV technology. The company is doubling down on mature nodes of 28nm+ and plans to build four new 12-inch wafer fabs in China that will begin operation after 2025, to become less reliant on imports.

Advanced technology nodes achieved by main foundries

	2018	2019	2020	2021	2022	2023	2024	2025	2026
TSMC	7nm		5nm		3nm			2nm	
Intel				7nm		4nm	3nm	2nm	
Samsung		7nm	5nm		3nm				2nm
⬇ No official access to EUV lithography equipment ⬇									
SMIC						7nm			5nm?



John LORENZ
Director, Memory & Computing at Yole Group

"It will take time for Chinese memory companies to deploy these components in vehicles. Automotive-grade memory must undergo stringent validation processes, often lasting 12 to 24 months, before OEMs or Tier 1 suppliers can approve them."

It remains to be seen whether rumors that SMIC is working toward 5nm production by 2025 or 2026 are correct. Without confirmed EUV capability, scaling to advanced nodes remains uncertain and highly constrained.

While many doubted the feasibility, SMIC surprised the industry by successfully achieving functional 7nm devices for Huawei smartphones using DUV lithography. However, 5nm devices will be more challenging. SMIC has yet to develop a 5nm equivalent node that can be produced at scale.

- Automotive-grade memory

Until this validation is complete, automakers are unlikely to substitute trusted global suppliers such as Micron, Samsung and SK Hynix with domestic alternatives. However, established Chinese memory producers like CXMT and YMTC have a head-start on this qualification process.

Even so, this slows local suppliers' ability to meet growing demand for memory in data-intensive applications like ADAS, digital cockpits and over-the-air updates.

GLOBAL SEMICONDUCTOR SUPPLIERS ARE STILL PART OF CHINESE OEMS' BILL OF MATERIALS, BUT FOR HOW LONG?

Yole Group predicts that for low- to mid-end cars, Chinese OEMs could use local suppliers within the next five years, owing to the large wafer capacity in China.

Chinese semiconductor companies*	Automotive strategy
Horizon Robotics	• Full-stack smart driving supplier around its Journey 6 SoCs variants to cover full scenario driving. Strong relations with Chinese OEMs and local JV of foreign brands like VW.
Huawei	• "Chinese Bosch" approach. Platform supplier for intelligent driving, cockpit and domain controllers. MDC platform is built on its Ascend AI SoC. Partnerships keep expanding with Chinese brands, now reaching premium segment with Aito.
Giga device	• Automotive MCU and memory supplier. Memory shipments are growing fast, and it continues expanding its MCU family.
Black Sesame Technologies	• Positioned as a SoC supplier for autonomous driving, cockpit and central compute applications. Recently partnered with Intel on integrated cockpit -driving platforms.
GalaxyCore	• CIS specialist expanding from mobile/IoT into automotive cameras • Building car-grade credibility with in-house 12-inch fab and quality systems.
Unisoc	• Supplier of IVI/cockpit and connectivity SoCs for smart cabins. Used by Chinese OEMs in mass-market infotainment; strategy centers on cost-effective integration and broad OS/hypervisor support.
SemiDrive	• Positioned as a smart-cockpit SoC, central compute processor and MCU supplier. Has reference designs with Rohm. Has been exchanging technologies with ROHM since 2019.
SiEngine	• Focused on cockpit SoC applications. Has a cost/performance approach tuned for China's mid-to-premium segments.
OmniVision	• Now part of Will Semiconductor. Large image sensor supplier for exterior, ADAS, in-cabin, and DMS applications.

** Non exhaustive list of companies*



04

TECH SHAPES STRATEGY: WHAT INNOVATION MEANS FOR MARKET CONTROL



How OEMs, Tier-1s and chipmakers must adapt to technological advancements.

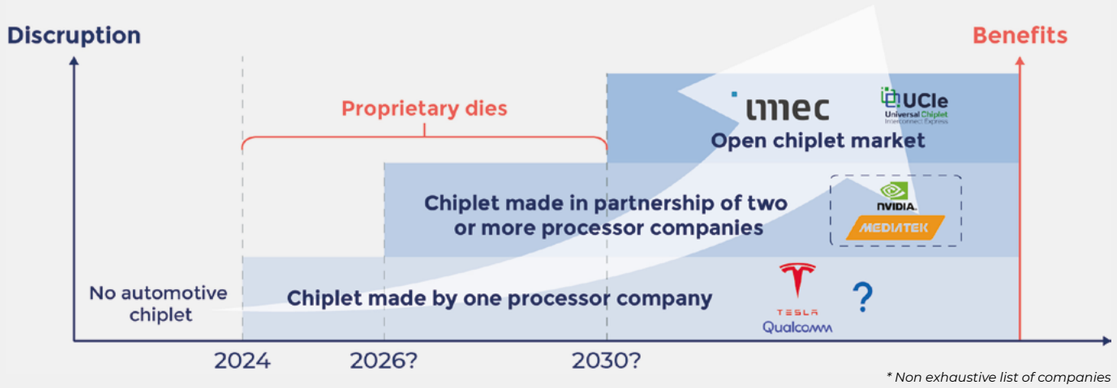
As vehicles become more software-defined, connected and autonomous, the ability to innovate at the chip level has become a core strategic differentiator. This shift is forcing automakers, Tier-1 suppliers and semiconductor firms to realign their development roadmaps. Companies that once competed on mechanical performance must now compete on compute power, AI capabilities and platform scalability.

To stay relevant, all players in the value chain must adapt through closer collaboration and a deeper understanding of how hardware and software advancements will shape future mobility.

WHY CHIPLETS MATTER FOR AUTOMOTIVE STRATEGY

As automotive systems grow more complex, chiplets are emerging as a promising solution to balance performance, scalability and cost. Instead of building large monolithic system-on-chips (SoCs), chiplet architectures allow semiconductor designers to integrate multiple specialized dies, such as compute, memory, I/O, and power management, into a single package.

Automotive industry - Various chiplet steps are possible



** Non exhaustive list of companies*

This modular approach supports the diverse requirements and features of modern vehicles, from high-performance ADAS and autonomous driving systems to zonal controllers and infotainment platforms.

To support this transition, industry players and consortia are working to develop open standards for chiplet interoperability, especially around interconnect protocols and packaging formats.

In a notable commercial validation of chiplet concepts, Nvidia and MediaTek announced a partnership in May 2023 to integrate a Nvidia GPU chiplet into MediaTek's Dimensity Auto platform. The CX-1 chip, enabling Large Language AI Models to run locally without relying on the cloud, could be available in vehicles around 2026–2027.

imec's Automotive Chiplet Program (ACP), launched in 2024, brings together stakeholders including Arm, BMW Group, Bosch, ASE, Valeo, and SiliconAuto, to support compliance with AEC-Q100 qualification standards.

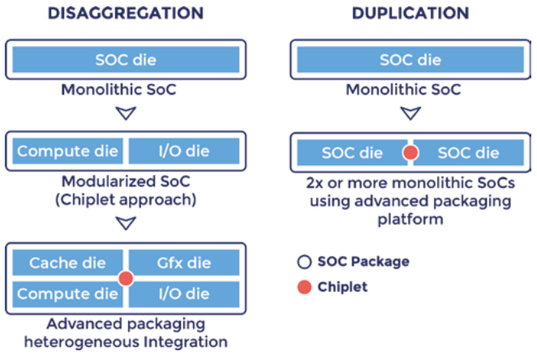
On the interconnect front, the Universal Chiplet Interconnect Express (UCIe) consortium, which includes key players like Intel, AMD, TSMC, and ASE, is establishing standards to enable seamless die-to-die communication across vendors. Efforts are also underway within groups like the Automotive Edge Computing Consortium and the broader RISC-V ecosystem to define chiplet-based reference architectures for in-vehicle applications.



Hugo ANTOINE
Market & Technology Analyst, Computing at Yole Group

"As chiplets move closer to mainstream deployment, they could redefine the semiconductor supply chain. This shift would enable greater specialization, faster innovation, enhanced safety, and more flexible sourcing strategies for automotive OEMs and Tier-1 suppliers"

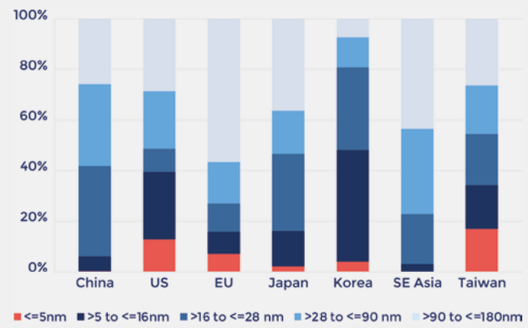
What is an automotive chiplet?
The answer lies in disaggregation and duplication



SCALING DOWN TO GEAR UP: PROCESS NODE TRENDS

Yole Group's forecast for global wafer capacity in 2030 by node and by region indicates strong growth in the US and the EU for cutting-edge nodes, reflecting initiatives from various government CHIPS Acts with investments from Intel, TSMC and STMicroelectronics, among others.

Automotive semiconductor trends -
2030 wafer capacity per month by node & by region



IN OTHER REGIONS

CHINA

- The strongest investments are set to be the 16-28nm range. They are driven by the government's self-sufficiency push and sustainable demand in EV and consumer electronics.
- Rising ADAS demand is fueling rapid chip design by Chinese firms for the local market.

JAPAN

Growth is likely to be balanced across nodes:

- 5–16nm capacity is rising by +13%.
- 16–28nm capacity is increasing by +38% led by companies like Kioxia and Renesas.

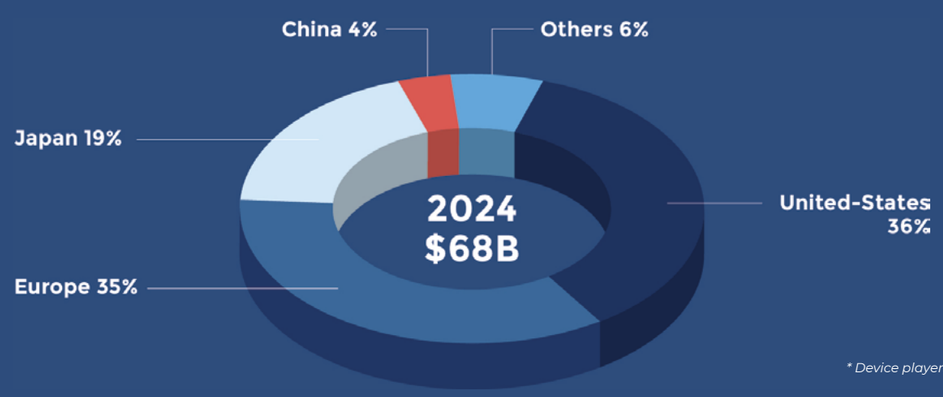
SOUTH KOREA

Automotive players perform strongly across all nodes below 28nm.
Samsung and SK Hynix are leading the way

TAIWAN

Growth will be led by TSMC's investment in nodes below 5nm.
Growth is expected to decelerate for nodes that already have a large installed base.

2024 Automotive semiconductor industry by region* (HQ)



** Device players revenue - HQ*

The next generation of high-performance processors for automotive will be produced using qualified platforms from TSMC or Samsung.

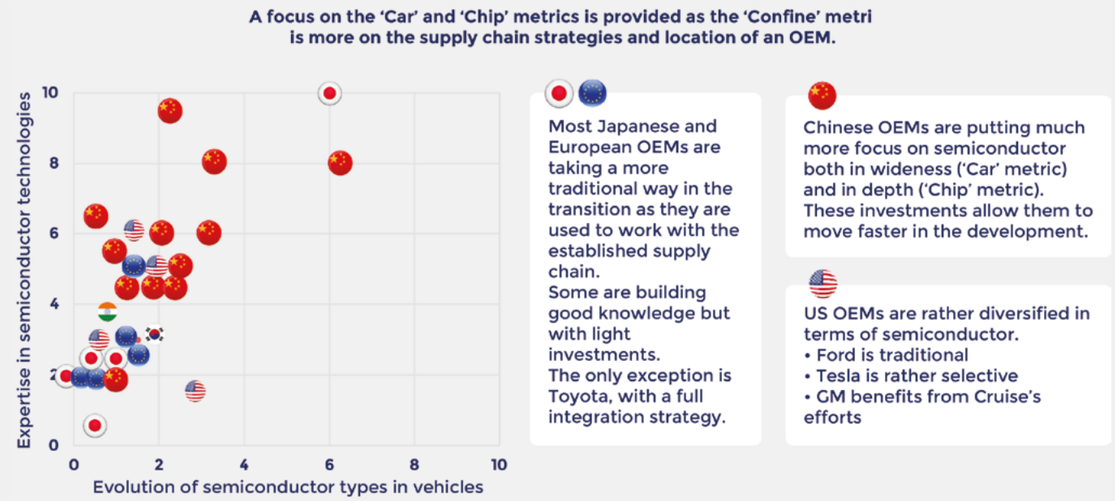
- Cockpit and ADAS applications can be centralized on the Nvidia Thor and Qualcomm Snapdragon Ride flex.
- The Mobileye EyeQ7, expected in 2025 with SOP in 2027, will be used for ADAS applications only, fusing data from cameras, radars and LiDAR.
- In 2025, Nio (Shenji NX9031) and Xpeng (Turing) became the first Chinese OEMs to deploy vehicles powered by self-developed 5 nm ADAS chips.
- Tesla is expected to equip its 2026 vehicles with its new AI5 hardware, featuring its 3rd generation FSD chip, expected to be manufactured on the 3nm node from TSMC and Samsung.
- Renesas has unveiled its first 3nm automotive SoC, the R-Car X5H, designed to power next-generation ADAS, infotainment, and vehicle central computing with enhanced AI performance and chiplet extensibility.

CHINA BUILDS SMARTER

As indicated by Yole Group's Triple-C model (Car, Chip and Confine metrics), Chinese automakers are putting much more focus on involvement in semiconductors both in wideness (the 'Car' metric) and in depth (the 'Chip' metric), than their overseas counterparts. These investments allow them to move faster in the development process.

Yole Group has extensively discussed the trend of consumer electronics players moving into the automotive industry. What did we learn from this?

Overview of the Triple-C Model - By Yole Group



With cars now incorporating more electronic control units (ECUs), sensors, displays and over-the-air capabilities, the line between traditional automakers and technology companies is blurring. Chinese electronics giants like Xiaomi and Huawei are expanding into the automotive supply chain, leveraging their expertise in consumer electronics, connectivity, and software integration to gain a foothold in one of the world's most electronics-driven automotive markets.

Triple-C Model - Xiaomi's SoC and investments*



Processor	BLACK SESAME TECHNOLOGIES, HUIXI, 杰平方
Sensors	robosense, HESAI, Sensata, Bareuska
Analog	Motorcomm, 荣湃, AIM AI Micron
RF	赛思领动 SINPRO
MCU	YESTE, 上海航芯, NUCLEI
Power	IVCT 鹏芯电子, BYD, Lcore, SOUTHCHIP, HYASIC 华源智信, EINNO

** Non exhaustive list of companies*

Automotive Supply chain - 'Invasion' of consumer electronics players*

Industry trends	Synergies on electronics	New players
• Consumer electronic demand is flat or even downward • Smartphone centralized lifestyle • Good brand awareness	Sensors	FOXCONN, LUXSHARE-ICT, SKYWORTH, HUAWEI, SONY, Qualcomm, NVIDIA, Nidec, DJI
• BEV has high certainty of fast growth in the next decades • BEV supply chain is more mature than before, and it is intrinsically easier than ICE cars • Car value shifting from mechanics to electronics and services	Battery Connectivity AI algorithem OS / UI High TOPS processors	

** Non exhaustive list of companies*



Anas CHALAK
Market & Technology Analyst, Imaging at Yole Group

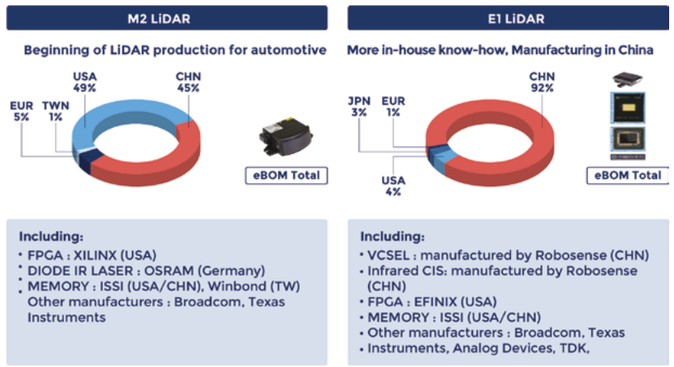
"When it comes to imaging hardware, the Chinese automotive camera ecosystem is becoming more vertical, with either components suppliers or camera manufacturers from other markets providing the entire camera module."

Chinese manufacturer Hesai produces its own ASICs, but these complement FPGAs. Nio does not manufacture LiDAR but plans to start mass production of its own APUs for LiDAR. Robosense has also revealed an in-house APU for its future MX LiDARs, scheduled for 2025.

Yole Group's teardown analysis of several LiDARs in the past year indicates how Chinese technology is advancing, with more in-house know-how and more components manufactured in China.

For instance, the Robosense M2 LiDAR, analyzed in 2024, represented the beginning of LiDAR production for automotive. Its electronic bill of materials (eBOM) contained 45% Chinese components by value and 49% from the US, along with 5% from Europe and 1% from Taiwan.

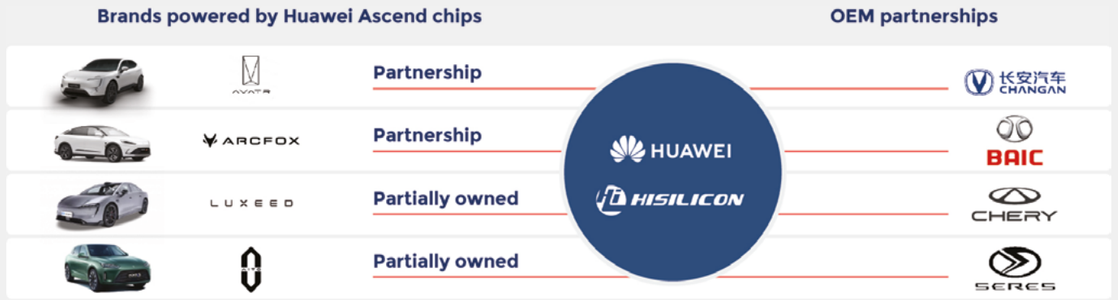
Chinese PLAYERS manufacture more & more their own chips – Robosense case study



The same is true for radar and computing. Electrification and the adoption of ADAS systems in low-end vehicles are leading to a push for local semiconductor production.

Nio is not the only OEM developing its own SOCs. Chinese players are learning fast, making their own lasers and receivers to reduce their reliance on Western companies. Yole Group expects Hesai's laser will no longer be supplied by Lumentum. Huawei's MDC Pro 610 ADAS Center Controller for Changan's Avatr 11 is using silicon from its own HiSilicon subsidiary, accounting for nearly 50% of its eBOM.

Main brands powered by Huawei Ascend chips



** Non exhaustive list of companies*



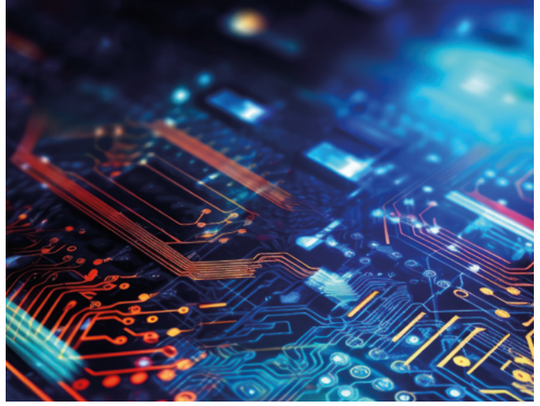
YU YANG
Principal Analyst, Automotive Semiconductors at Yole Group

"We see that the Chinese players are covering more semiconductor technology, from electronics related to car electrification to SOCs and ECUs for ADAS, infotainment and networking, areas where OEMs are pushing. OEMs are forming partnerships with suppliers and designing or producing their own devices to achieve deeper knowledge of the technology"



Benjamin PUSSAT
Senior Technology & Cost Analyst at Yole Group

"In contrast, the Robosense E1 LiDAR, analyzed in 2025, had an eBOM comprising 92% Chinese components by value and just 4% from the US, with 3% from Japan and 1% from Europe."



05
THE ROAD AHEAD

WHAT COMES NEXT AND WHAT WE ARE WATCHING?

The automotive semiconductor industry is at the intersection of multiple technological and strategic shifts. Electrification, the rise of AI-powered ADAS and autonomous systems, and the shift from legacy ECUs to centralized computing platforms, have changed the demands placed on semiconductor suppliers.

In response, the leading global players are evolving their strategies, some doubling down on power and analog leadership, others racing to deliver high-performance compute and scalable software-defined architectures. The supply chain continues to adapt, with OEMs rethinking sourcing models and governments reshaping manufacturing supply chains through trade policies, subsidies and national targets.

Geopolitical tensions continue to cloud the outlook for cross-border technology access, particularly as US restrictions limit China's ability to scale below 10nm.

The industry's most promising opportunities—including high-performance compute for ADAS, autonomous driving and in-cabin AI—depend on access to leading-edge process nodes below 5nm. This is where global incumbents like Nvidia retain a clear lead and where new Chinese entrants, despite aggressive investment, have yet to prove their ability to deliver automotive-quality products.

Replacing Nvidia's dominant position in ADAS and autonomous compute will not happen quickly—if at all—given its deep software ecosystem, IP stack, and relationships with Tier-1 suppliers and OEMs.

As the transition to advanced automotive semiconductor technologies accelerates, several pressing questions emerge:

- How will the race for advanced process nodes shape competition between global players?
- Can the supply chain keep up with the rapidly increasing demand for high-performance compute and AI chips?
- How will China's domestic ecosystem evolve?
- Who will win the battle of software-defined vehicle platforms?



Claire TROADEC
Director, Global Semiconductor at Yole Group

"For all semiconductor players, the next phase of development will require technical innovation as well as strategic clarity, long-term partnerships and deep alignment with the evolving needs of global automakers"

As automotive chip demand expands and the stakes grow, Yole Group's analysts will continue to provide in-depth insights into the ecosystem, from high-performance compute trends and supply chain risks to product teardowns.

AUTOMOTIVE ANALYSES BY YOLE GROUP

2024 was a pivotal year for the automotive industry. 2025 is expected to bring new challenges. Electrification and ADAS are accelerating demand for semiconductors, as innovations in sensors, processing, and power electronics redefine vehicle safety and autonomy.

Yole Group's focus on emerging automotive technologies – such as advanced ADAS, 800V systems, and SiC-based power electronics – highlights its role in enabling safer, more efficient, and sustainable mobility.

With the market experiencing exaggerated shifts and growing pressure, keeping up with technological change is more important than ever. That's why Yole Group's analysts closely track these rapid developments – to seize new opportunities and keep pushing innovation forward.

Market & Technology Reports
Automotive Computing and AI 2025
Status of the Microcontroller Industry 2025
Automotive Semiconductor Trends 2025
Automotive Powertrain and Electrification 2025
Automotive 48V Powernet 2025
Automotive Radar 2025
Automotive Imaging 2025
Automotive LiDARs 2025

Teardowns
Automotive MEMS Inertial Sensors Comparison 2025
Automotive Radar Chipset Comparison 2025
Automotive SoC Comparison 2025 - ADAS
Automotive IR Comparison 2025
Automotive CIS Comparison 2025
Automotive MicroLED Comparison 2025
Automotive BMS Comparison 2025

As well as the **Automotive Teardown Tracks and its 5 modules** (ADAS - Electrification - Infotainment - Telematics - Other ECUs) including:
LiDARs - Huawei – ADAS
Radar - Continental – ADAS
Inverter - Tesla - Electrification
Smart Cockpit Controller - FinDreams Technology - Infotainment



ABOUT YOLE GROUP

Yole Group is a leading international market research and strategy consulting firm, delivering in-depth analyses across market trends, technology developments, teardowns, and reverse costing. Leveraging deep semiconductor expertise, its team of analysts also provides custom consulting services, offering strategic, technical, and market insights tailored to address specific business challenges and opportunities.

More information on www.yolegroup.com

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