*The information and statistics set out in this section and other sections of this document were extracted from different official government publications, available sources from public, market research and other sources from independent suppliers, and from the independent industry report prepared by Frost & Sullivan. The information from official government sources has not been independently verified by us, the Joint Sponsors, **[REDACTED]**, any of their respective directors and advisors, or any other persons or parties involved in the **[REDACTED]**, and no representation is given as to its accuracy.*

EVOLUTION OF EDGE-TO-CLOUD CONNECTIVITY AND COMPUTING INFRASTRUCTURE

Successive Waves of Technological Progress Are Driving Demand for Cellular Connectivity

Cellular baseband technologies form a fundamental infrastructure for ubiquitous connectivity and the exchange of information, which underpins the efficiency and productivity of modern society. As economic and social activities become increasingly digital, the ability to transmit, process and respond to data in real time has become central to how people live, how enterprises operate and how industries evolve. This has driven the continuous advancement of cellular baseband technologies toward higher bandwidth, lower latency, broader coverage, greater reliability and higher energy efficiency. Each wave of technological progress creates new possibilities for interaction among people, machines and systems, while also raising the performance requirements for cellular connectivity. The development of mobile internet and widespread adoption of smartphones drove substantial demand for cellular baseband technologies. The subsequent expansion of the Internet of Things ("**IoT**") extended the reach of cellular connectivity across an increasingly diverse range of devices spanning consumer, enterprise, industrial and automotive applications. This evolution marks a structural shift in cellular connectivity demand, with IoT emerging as the principal engine of growth. The increasing number and diversity of connected devices have further created sustained demand for wide-area connectivity, local processing and application-specific semiconductor solutions. The installed base of connected devices and distributed computing infrastructure has laid the foundation for increasingly sophisticated digital applications, including AI.

AI Is Entering an Era of Large-Scale Inference across Cloud, Edge and Smart Devices

AI foundation models have advanced significantly in multimodal perception, reasoning, content generation, tool use and task execution. Improvements in model capability, efficiency and adaptability are enabling AI systems to perform practical tasks and improve productivity, automation and user experience. AI is therefore being deployed across consumer, enterprise and industrial applications spanning cloud services, smart devices and physical systems. AI capabilities are also enabling connected devices to perceive, analyze and respond to information with greater autonomy, supporting the emergence of the Intelligence of Things. Agentic AI is further broadening practical applications by enabling systems to plan and execute multi-step tasks, repeatedly invoke models and software tools, and interact with digital and physical environments. Broader AI adoption and increasing use of agentic workflows are making inference a larger and more recurring source of computing demand, with workloads increasing in frequency, diversity and volume.

Cloud infrastructure provides the large-scale computing resources required for model training and compute-intensive inference, while edge infrastructure and smart devices increasingly process workloads requiring faster response, greater privacy, higher availability, lower communication costs or offline operation. AI workloads are consequently distributed across cloud, edge and smart device environments according to their respective performance, latency, privacy, power consumption and cost requirements. This distribution of workloads creates complementary demand for computing capabilities and reliable connectivity to coordinate processing across these environments.

Expanding Connectivity and Computing Requirements Are Reshaping Semiconductor Infrastructure

The proliferation of connected devices, broader AI adoption and increasingly distributed computing workloads are creating differentiated semiconductor requirements. Cellular connectivity chips support continuous and reliable data exchange across connected devices, edge infrastructure and cloud infrastructure; smart device SoCs provide integrated computing capabilities for advanced device functions; and custom ASIC services support the development of chips optimized for specific workloads, system architectures and deployment environments.

Cellular connectivity chips enable ubiquitous connectivity for distributed applications. As AI workloads become more widely distributed, data, instructions and inference results must be exchanged continuously and reliably among devices, edge infrastructure and cloud resources. Cellular connectivity is the only mainstream wireless technology capable of providing ubiquitous, wide-area mobile connectivity on an anytime-anywhere basis, enabling devices to remain connected across locations and operating environments beyond the reach of fixed and local-area networks. Growing AI inference workloads, particularly multimodal and interactive applications, are increasing the volume and frequency of data exchange and creating more differentiated requirements for throughput, latency, connection reliability and power efficiency. Rising connectivity requirements are expected to drive demand for more advanced and reliable cellular connectivity technologies and cellular connectivity chips across different performance tiers.

Increasing on-device intelligence is reshaping smart device SoC requirements. AI inference is increasingly being performed on smart devices to support applications requiring real-time responsiveness, data privacy, offline availability, lower communication costs and reduced reliance on cloud processing. Smart devices are consequently becoming more capable local computing platforms that can perceive, process and respond to information with greater autonomy. Growing on-device AI workloads are increasing requirements for computing performance, power efficiency, memory bandwidth and system-level integration. Smart device SoCs are therefore incorporating greater general-purpose computing capacity, dedicated AI acceleration, multimedia processing, security and connectivity capabilities within stringent power, cost and form-factor constraints. Greater functional integration supports more sophisticated AI-enabled applications while reducing system complexity and improving overall device efficiency.

Diversified computing workloads are expanding demand for custom ASIC services. As AI applications become more diversified, computing requirements are becoming increasingly differentiated across workloads and deployment scenarios, particularly in terms of performance, power efficiency, latency, integration and cost. General-purpose chips may not always deliver the optimal balance across these parameters. Custom ASICs are therefore becoming increasingly relevant for customers with sufficiently large, stable or specialized workloads that can benefit from application-specific hardware optimization. Advanced chip development requires expertise across system architecture, semiconductor IP, hardware-software co-design, functional verification, physical design, tape-out and supply-chain management. Rising technical complexity, development costs and execution risks are encouraging more system and technology companies to engage specialized third-party custom ASIC service providers rather than build and maintain the full range of semiconductor design and commercialization capabilities in-house.

OVERVIEW OF GLOBAL CELLULAR CONNECTIVITY CHIP MARKET

Introduction of Cellular Connectivity Chips

Cellular connectivity chips are a subset of wireless connectivity chips that enable IoT devices to access and communicate over cellular networks by supporting cellular communication protocols and related data transmission functions, and constitute the core communications component of cellular-connected devices. Cellular connectivity chips play a fundamental role within the broader wireless connectivity landscape by providing ubiquitous wide-area coverage, mobility and continuous network access. Wide-area coverage, mobility and continuous network access are becoming increasingly relevant as smart devices operate across more distributed and mobile environments and require persistent interaction with edge and cloud computing resources. Cellular connectivity chips can be broadly categorized into 4G, 5G and other cellular connectivity chips, each addressing different requirements for data rate, power consumption, network coverage, and cost.

Comparative Analysis of Major Technology Routes of Cellular Connectivity Chips

	4G Technology			5G Technology	
	Cat.1	**Cat.4**	**Cat.6 and above**	**5G RedCap**	**5G eMBB**
Bandwidth (Hz)	20M	20M	40–100M	20M	100M
Download Peak Data Rate (bps)	10M	150M	300M–2G	220M	20G
Upload Peak Data Rate (bps)	5M	50M	≥50 M	120M	10G
Power Consumption	Low	Medium	Relatively High	Relatively Low	High
Cost	Relatively Low	Medium	Relatively High	Relatively High	High
Main Characteristics	Balanced performance	Higher data rate	Carrier aggregation, higher data rate	Reduced complexity, cost	Ultra-high data rate

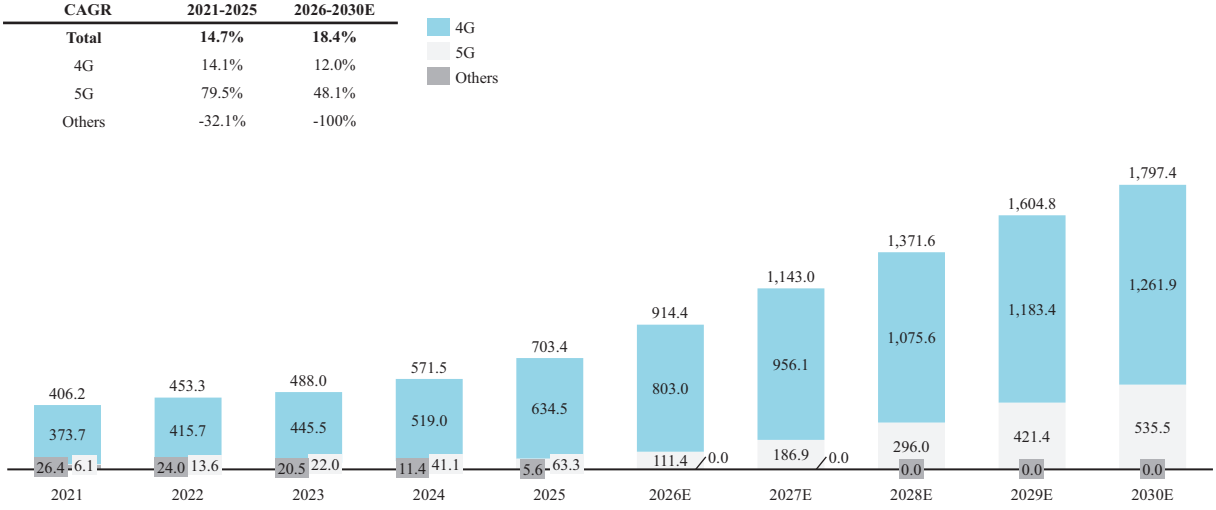
Source: Frost & Sullivan

Market Size of Global Cellular Connectivity Chips Market

The shipments of 4G and 5G cellular connectivity chips reached 634.5 million and 63.3 million in 2025, representing CAGRs of 14.1% and 79.5% from 2021 to 2025, respectively. As cellular communication technologies continue to evolve and downstream devices progressively migrate toward higher-generation standards, the shipments are projected to reach 1,261.9 million and 535.5 million by 2030, representing CAGRs of 12.0% and 48.1% from 2026 to 2030, respectively.

Global Cellular Connectivity Chips Market Size, in terms of Shipments, by Technology (Million, 2021-2030E)

CAGR	2021-2025	2026-2030E
Total	**14.7%**	**18.4%**
4G	14.1%	12.0%
5G	79.5%	48.1%
Others	-32.1%	-100%



Source: Frost & Sullivan

Note: Other cellular connectivity chips refer to cellular connectivity chips based on 2G and 3G technologies.

Driving Forces and Future Trends of Global Cellular Connectivity Chips Market

- ***Continued evolution of cellular technologies.*** Cellular communication technologies continue to evolve from 4G to 5G and toward future 6G standards, expanding the performance envelope of cellular connectivity across data rate, latency, reliability, power consumption and connection capabilities. These advances support real-time interaction, large-scale device connectivity and data-intensive AI applications. As connectivity requirements become increasingly differentiated across applications, 4G, 5G RedCap, 5G eMBB and more advanced cellular technologies are expected to address distinct performance and cost requirements, driving continued upgrades and diversification of cellular connectivity chip portfolios. Further advances in 5G and the development of 6G are also expected to enable closer integration of communications with AI and sensing capabilities, further expanding the range of applications for cellular connectivity chips.

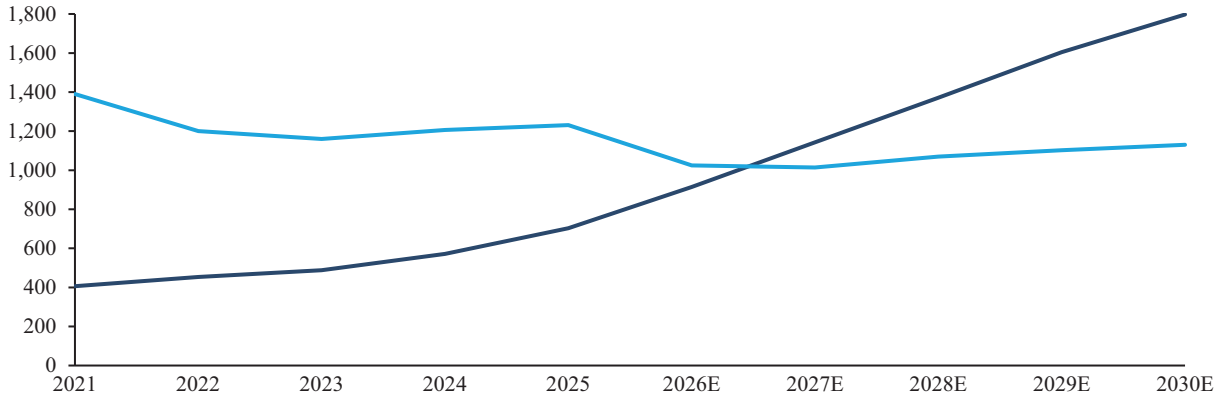
- ***Rising demand for ubiquitous and high-performance connectivity in the AI era.*** The proliferation of AI-enabled devices and distributed AI applications is increasing the demand for continuous, reliable data exchange and computing coordination across devices, edge and cloud. As AI extends into vehicles, wearables, industrial equipment and other mobile and distributed applications, cellular connectivity enables intelligent devices to remain connected while moving at speed, operating across regions or functioning beyond the reach of fixed networks. Short-range technologies such as Wi-Fi and Bluetooth play complementary roles in fixed or local environments but cannot substitute for cellular networks where wide-area coverage and seamless mobility are required. This makes cellular connectivity an irreplaceable foundation for AI operating in the real world. Multimodal and interactive AI applications also impose increasingly differentiated requirements for throughput, latency, reliability and power efficiency, driving demand for cellular connectivity chips across different performance tiers.

- ***Structural shift in cellular connectivity demand toward IoT.*** Cellular connectivity is increasingly extending into a broader range of intelligent and connected devices, expanding the addressable market for cellular connectivity chips. Driven by the continued proliferation of such

devices and use cases, global shipments of cellular IoT devices are expected to grow at a CAGR of 18.4% over the forecast period and surpass smartphones shipment in 2027, marking a structural shift in cellular connectivity demand toward a more diversified base of end devices.

Global shipments of cellular IoT devices and smartphones (Million)

CAGR	2021-2025	2026-2030E
Cellular IoT devices	14.7%	18.4%
Smartphones	-3.0%	-1.7%



Source: Frost & Sullivan

- ***Increasing integration of connectivity and edge computing.*** As intelligent edge applications become more sophisticated, cellular connectivity chips are increasingly integrating processing, positioning, security and other system-level functions to improve system efficiency and reduce device complexity. Achieving this integration draws on accumulated capabilities in cellular baseband, RF, protocol stacks, low-power design, interoperability testing and certification. Combined with system-level semiconductor design and commercialization experience, these capabilities also provide a technology foundation for the development of more complex, highly integrated SoCs and other intelligent semiconductor products.

- ***Rising competitiveness of Chinese providers.*** China-based cellular connectivity chips providers are strengthening their competitiveness through continued investment in cellular baseband technologies, broader product coverage and increasing mass-production experience, supporting further expansion in domestic and overseas markets.

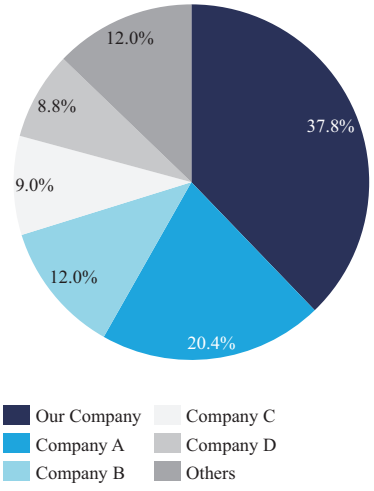
Competitive Landscape of Global Cellular Connectivity Chips Market

The global cellular connectivity chips market is characterized by high technological barriers, long product-development cycles and extensive certification requirements. Competition is primarily shaped by accumulated capabilities in multi-mode cellular baseband technologies, coordinated baseband, RF and protocol-stack design, low-power optimization, product-portfolio coverage, interoperability and operator certification, and large-scale commercialization. China-based cellular connectivity chips providers are also strengthening their competitiveness through continued investment in cellular baseband technologies, broader product coverage and increasing mass-production experience in domestic and overseas markets.

In terms of shipment of cellular connectivity chips in 2025, our Company ranked first among global cellular connectivity chip providers overall and in the Cat.1 and Cat.4 segments, with market shares of 37.8%, 51.6% and 52.5%, respectively.

Ranking of Top 5 Cellular Connectivity Chips Providers, in terms of Shipment, 2025

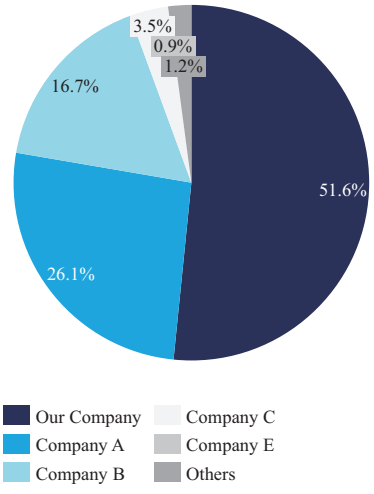
Ranking	Providers	Shipment (Million, 2025)
1	**Our Company**	**266.0**
2	Company A	143.8
3	Company B	84.1
4	Company C	63.0
5	Company D	62.1



Source: Public fillings, company websites, expert interviews, Frost & Sullivan

Ranking of Top 5 Cellular Connectivity Chips Providers, in terms of Shipment of Cat.1 Chips, 2025

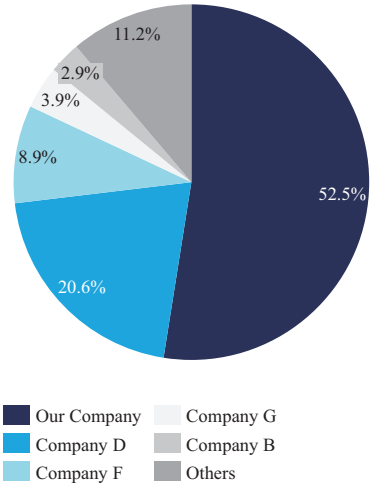
Ranking	Providers	Shipment (Million, 2025)
1	**Our Company**	**206.7**
2	Company A	104.8
3	Company B	67.0
4	Company C	14.2
5	Company E	3.6



Source: Public fillings, company websites, expert interviews, Frost & Sullivan

Ranking of Top 5 Cellular Connectivity Chips Providers, in terms of Shipment of Cat.4 Chips, 2025

Ranking	Providers	Shipment (Million, 2025)
1	**Our Company**	**53.5**
2	Company D	21.0
3	Company F	9.1
4	Company G	4.0
5	Company B	3.0



Source: Public fillings, company websites, expert interviews, Frost & Sullivan

Notes:

1) Company A is a private company founded in 2017 and headquartered in Shanghai, China, primarily engaged in providing cellular connectivity chips.

2) Company B is a private company founded in 2013 and headquartered in Shanghai, China, primarily engaged in providing wireless communication chips, IoT chips and automotive chips.

3) Company C is a private company founded in 2017 and headquartered in Shanghai, China, primarily engaged in providing cellular connectivity chips.

4) Company D is public company founded in 1985 and listed on Nasdaq, headquartered in U.S., primarily engaged in providing wireless communication chips, other semiconductor products and custom ASIC services.

5) Company E is a private company founded in 2021 and headquartered in Shenzhen, China, primarily engaged in providing cellular connectivity chips.

6) Company F is a public company founded in 1946 and listed on the Tokyo Stock Exchange and the New York Stock Exchange, headquartered in Japan, primarily engaged in games, music, pictures, electronics and imaging solutions.

7) Company G is a public company founded in 1997 and listed on the Taiwan Stock Exchange, headquartered in Taiwan, China, primarily engaged in providing mobile computing chips, connectivity chips, automotive chips and analog chips, and custom ASIC chips.

The Company is also a leading provider across selected downstream applications. By shipment volume of cellular connectivity chips in 2025, it ranked first globally under the field of sharing economy. By shipment volume of 4G cellular connectivity chips in 2025, it ranked first globally under the field of mobile gateway devices and the field of battery management system ("**BMS**"); it also ranked second globally and first among China-based providers under the field of automotive electronics. By shipment of Cat.1 cellular connectivity chips in 2025, it ranked first globally under the field of wearable devices and the field of smart electric meters. By shipment of Cat.4 cellular connectivity chips in 2025, it ranked first globally under the field of smart grid.

Key Success Factors and Entry Barriers of Global Cellular Connectivity Chips Market

- ***Multi-standard protocol expertise and continuous standards evolution.*** Cellular connectivity chip providers require accumulated expertise across multiple generations of cellular standards and non-cellular communication protocols, as well as scalable technology platforms that can evolve with changing standards and customer requirements. Such capabilities enable providers to shorten product development cycles and efficiently extend proven technologies across successive product generations.

- ***Integrated baseband, RF and protocol-stack design.*** Cellular connectivity performance depends on the coordinated design and optimization of baseband processors, RF transceivers, protocol stacks and system software. Strong system-level integration capabilities are critical to achieving network compatibility, communication stability, data throughput and power efficiency across different network environments and device configurations.

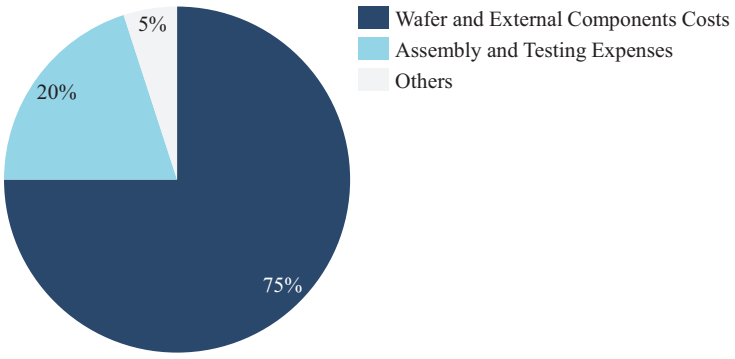
- ***Optimization of cellular performance and power efficiency.*** Cellular connectivity chips must balance coverage, data throughput, latency, reliability and power consumption across different network environments and device configurations. This requires coordinated optimization of chip architecture, communication algorithms, RF design and power management.

- ***Interoperability testing and certification capabilities.*** Commercialization of cellular connectivity chips requires extensive interoperability testing, operator qualification and regulatory certification across different devices, networks and markets. Long validation cycles and application integration requirements not only create meaningful barriers to entry for new market participants, but also contribute to long-term customer relationships once suppliers achieve successful commercial deployment. Accumulated certification experience and proven mass-production capabilities further strengthen these barriers. Commercially viable cellular baseband development also requires sustained R&D investment across successive generations of standards and coordinated hardware-software co-design. Because protocol expertise, interoperability records, operator qualification experience and mass-production know-how are accumulated over extended development cycles, these capabilities are generally difficult for new entrants to assemble or replicate rapidly.

Cost Analysis of Cellular Connectivity Chip

The cost structure of cellular connectivity chips mainly include wafer and external components costs as well as assembly and testing expenses. The cost of procuring wafers from foundries constitutes the largest portion of the overall expenses. Wafer and external components cost account for approximately 75% of total cellular connectivity chips cost in 2025. The remaining assembly and testing expenses account for about 20% of total cost in 2025.

Cost Analysis of Cellular Connectivity Chips



Source: Frost & Sullivan

OVERVIEW OF GLOBAL SMART DEVICE SOC MARKET

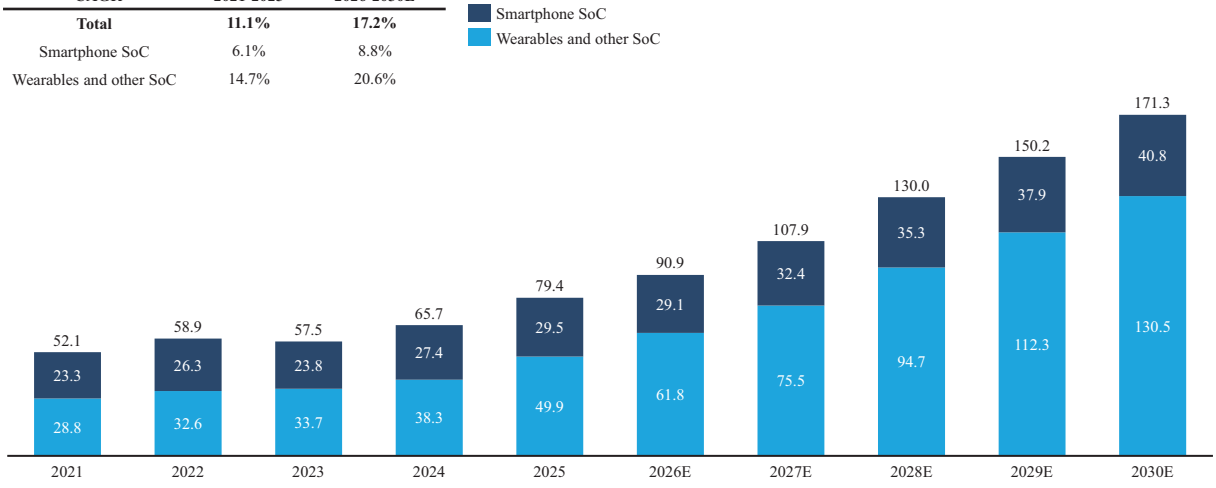
Introduction and Market Size of Smart Device SoCs

Smart device SoCs are highly integrated semiconductor products designed to perform application processing, multimedia processing, connectivity, AI computing and system control functions within smartphones and other smart devices. A smart device SoC may integrate CPUs, GPUs, NPUs, ISPs, memory interfaces, connectivity modules, security components and power-management functions. As smart devices support increasingly sophisticated AI, multimedia and interactive functions, SoCs are required to deliver greater computing performance and integration within stringent power, thermal, form-factor and cost constraints, increasing the importance of complex SoC architecture design, system-level integration and power optimization.

The market size of the global smart device SoCs market, in terms of revenue, increased from USD52.1 billion in 2021 to USD79.4 billion in 2025, representing a CAGR of 11.1% from 2021 to 2025. Of which, the revenue of smartphone SoCs and wearables and other SoCs markets reached USD29.5 billion and USD49.9 billion in 2025, representing CAGRs of 6.1% and 14.7% from 2021 to 2025, respectively. The revenue of the global smart device SoCs market is projected to reach USD171.3 billion by 2030, representing a CAGR of 17.2% from 2026 to 2030. Of which, the revenue of smartphone SoCs and wearables and other SoCs markets is expected to reach USD40.8 billion and USD130.5 billion in 2030, representing CAGRs of 8.8% and 20.6% from 2026 to 2030, respectively.

Global Smart Device SoC Market, in terms of Revenue, by Products (USD in billions, 2021-2030E)

CAGR	2021-2025	2026-2030E
Total	**11.1%**	**17.2%**
Smartphone SoC	6.1%	8.8%
Wearables and other SoC	14.7%	20.6%



Source: Frost & Sullivan

Driving Forces and Future Trends of Global Smart Device SoC Market

- ***Growing adoption of on-device AI.*** Smart devices are increasingly performing AI functions such as speech recognition, image processing, content generation and contextual understanding locally. On-device AI can reduce response latency and reliance on cloud computing and data transmission, while improving service availability and supporting applications with greater requirements for data privacy.

- ***Expansion of smart device applications.*** The continued proliferation of connected and intelligent devices is broadening the application scope of smart device SoCs. Increasingly diversified device requirements are supporting demand for differentiated SoC products across a wider range of smart-device applications.

- ***Convergence of application processing, connectivity and AI computing.*** Smart device SoCs are further integrating application processing, AI computing, multimedia processing, connectivity, security and other system functions to improve overall system efficiency within constrained power, space and cost parameters. As smart-device functionality becomes more complex, standalone computing performance alone is becoming less representative of overall product competitiveness, requiring semiconductor providers to coordinate and optimize computing, connectivity and AI capabilities within a unified platform. Platform-based development and reusable IP can also support product extension and iteration across different smart-device categories.

Competitive Landscape of Global Smart Device SoC market

The overall global smart device SoC market is highly competitive, with a broad range of suppliers serving diverse application segments. Competition varies across product segments depending on performance requirements, target applications, and commercialization capabilities, with market participants differentiating themselves through product positioning, technology platforms and application coverage. In particular, the global smartphone SoC market is highly concentrated, primarily due to its stringent technological requirements and high barriers to entry, with only a limited number of players possessing cellular connectivity capabilities. In terms of shipments in 2025, the top three providers of smartphone SoCs accounted for approximately 45%, 35% and 15% of the market shares, respectively.

As smart devices continue to evolve toward greater functionality, connectivity and intelligence, the competitive focus of the market is increasingly extending beyond standalone processing performance toward system-level capabilities. In particular, smart device SoCs are increasingly required to combine computing, cellular and other wireless connectivity, multimedia processing and other system functions within increasingly stringent power, thermal, form-factor and cost constraints. The growing adoption of on-device intelligence is further increasing requirements for computing efficiency and system-level optimization. As a result, SoC architecture design, functional integration, power efficiency and scalable platform development are becoming increasingly important competitive capabilities.

Our Company has established capabilities across cellular and other wireless connectivity technologies, complex SoC design, multimedia processing, computing and reusable semiconductor IP, supported by platform-based development and system-level optimization capabilities. These capabilities are aligned with the evolving requirements of the smart device SoC market and provide a foundation for our Company to broaden its product coverage, strengthen its competitive position and further expand its market presence as smart device applications continue to develop.

Key Success Factors and Entry Barriers of Global Smart Device SoC Market

- ***Heterogeneous SoC architecture and system-integration capabilities.*** Smart device SoCs require the coordinated integration of CPUs, GPUs, NPUs, ISPs, multimedia engines, memory interfaces, connectivity modules, security components and power-management functions within a unified architecture. Strong system-integration capabilities are critical to achieving balanced performance, power efficiency, functionality and cost across increasingly complex smart-device applications.

- ***On-device AI hardware and software co-optimization.*** Effective on-device AI performance depends on the joint optimization of processor and NPU architectures, model adaptation, compilers, runtime software and AI development tools. Strong hardware-software co-optimization capabilities enable semiconductor companies to translate theoretical computing performance into efficient and stable real-world AI performance across different applications.

- ***Smart-device software ecosystems and customer integration.*** Commercial adoption of smart device SoCs requires compatibility with operating systems, software frameworks, multimedia pipelines and device hardware platforms, together with sustained technical collaboration with smart-device manufacturers throughout product development and validation. Established providers typically benefit from accumulated technology platforms, product-validation experience and customer relationships, which can support subsequent product development and customer adoption. Lengthy development cycles, customer-validation processes and continued technical collaboration also create meaningful barriers to entry and can strengthen long-term relationships for suppliers with proven commercial deployments.

OVERVIEW OF GLOBAL CUSTOM ASIC SERVICE MARKET

Custom ASIC Services Becomes a Key Enabler of Specialized AI Computing

Advances in AI foundation models are accelerating the large-scale deployment of inference across cloud infrastructure, edge infrastructure and smart devices. As AI applications broaden and inference workloads increase in frequency, diversity and volume, computing requirements are becoming increasingly differentiated in terms of performance, energy efficiency, latency, memory access, system integration and cost. Application and system companies serving specific use cases often run proprietary or differentiated workloads and face distinct requirements related to algorithms, system architectures, deployment environments, product form factors and cost targets, creating demand for scenario-specific chip customization. General-purpose chips may not deliver an optimal balance of performance and economics across all such requirements. Where workloads are sufficiently large, stable or specialized,

custom ASICs optimized around specific application and product requirements can improve performance per watt, latency, integration and total cost of ownership, supporting their increasing relevance across cloud, edge and device computing.

Developing production-ready custom ASICs requires expertise across system architecture, semiconductor IP integration, hardware-software co-design, functional verification, physical design, tape-out, production ramp-up and supply-chain execution. Rising development complexity, costs and execution risks make a full in-house semiconductor development platform increasingly difficult and resource-intensive to maintain. Specialized custom ASIC service providers combine established design platforms, reusable IP, engineering expertise and production support to translate customers' scenario-specific application, system and product requirements into silicon solutions capable of volume production, forming an important link between application requirements and silicon implementation.

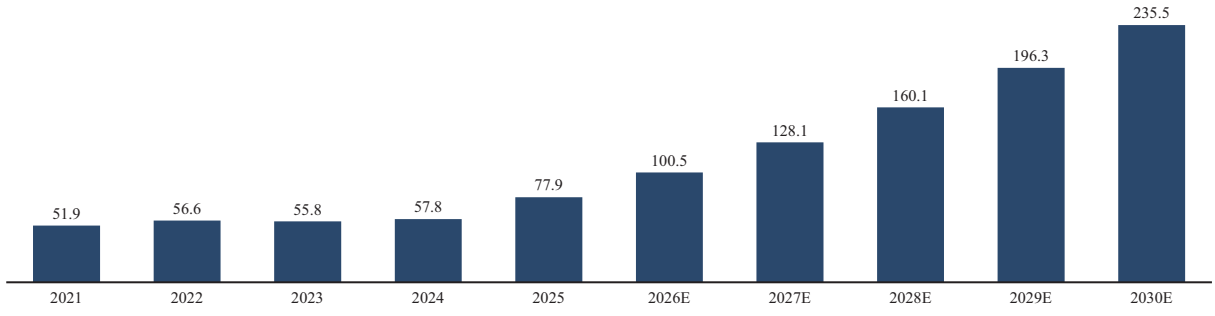
Custom ASIC design services refer to customized semiconductor design and delivery services developed according to customers' specific requirements for computing performance, functionality, power consumption, interfaces, integration, cost and deployment environments. Such services may cover the IC development lifecycle from chip specification and architecture design to IP integration, design and verification, tape-out, packaging and testing, supply-chain management and volume-production delivery, and are widely applied across AI computing, servers, storage, smart devices and other edge and cloud computing applications.

Market Size of the Global Custom ASIC Services Market

In terms of revenue, the global custom ASIC services market increased from USD51.9 billion in 2021 to USD77.9 billion in 2025, representing a CAGR of 10.7% from 2021 to 2025. Going forward, continued growth in AI computing demand, increasing diversification of customer requirements and broader adoption of customized semiconductor architectures are expected to further support market expansion. The global custom ASIC services market is projected to reach USD235.5 billion by 2030, representing a CAGR of 23.7% from 2026 to 2030.

Revenue of global custom ASIC services market (USD in billions)

CAGR	2021-2025	2026-2030E
Total	10.7%	23.7%



Source: Frost & Sullivan

Drivers and Future Trends of Global Custom ASIC Services Market

- ***Rapid growth of customized AI inference computing and specialized workloads.*** With the massive deployment of generative AI applications, compute demand is shifting from training to inference, where energy efficiency, unit cost, and latency are critical. General-purpose processors often lead to resource waste under specific tasks, whereas custom ASIC services enable the delivery of optimized, application-specific architectures that achieve superior energy efficiency and cost-effectiveness for large-scale workloads.

- ***Expansion of AI inference across cloud, edge, and device environments.*** AI inference is proliferating across hyperscale data centers, edge infrastructure, mobile devices, smart wearables, and industrial equipment. Variations in workload characteristics, latency constraints, thermal limits, and deployment environments are generating strong demand for tailored chip architectures that can satisfy diverse scenario-specific requirements.

- ***Accelerated shift toward proprietary silicon and system-level integration among cloud service providers and system vendors.*** Driven by the goal of optimizing Total Cost of Ownership (TCO), reducing reliance on single-source suppliers, and achieving hardware-software co-design, major tech enterprises are accelerating their adoption of customized silicon. Furthermore, customers increasingly require custom ASIC services to integrate computing, connectivity, storage interfaces, and system control into unified architectures, reducing system complexity and component count.

- ***Proliferation of emerging applications powered by RISC-V and advanced process nodes.*** The maturation of the open-source RISC-V architecture has expanded access to specialized processor design and can reduce initial architecture-development barriers and costs. Meanwhile, rising design complexity at advanced process nodes is increasing demand for custom ASIC services in areas such as IP integration, physical implementation and timing closure, supporting continued demand for professional NRE partnerships.

- ***Increasing importance of memory bandwidth, high-speed interconnect and advanced packaging.*** As AI chips scale in computing density and system complexity, performance increasingly depends on efficient data movement, memory access and chip-to-chip communication. This is increasing the importance of high-bandwidth memory subsystems, high-speed interconnect technologies and advanced packaging capabilities in complex cloud and edge AI custom ASIC projects.

Competitive Landscape of Global Custom ASIC Services Market

The global custom ASIC services market is highly competitive, with market participants competing across technology capabilities, development efficiency, project execution and commercialization experience.

Market participants can generally be classified into product-based ASIC design service providers and pure-play ASIC design service providers. Product-based ASIC design service providers engage in both proprietary standard IC product development and IC customization services, while pure-play ASIC design service providers primarily focus on customer-specific IC customization services. Product-based ASIC design service providers generally benefit from technologies, reusable IP, design platforms and engineering experience accumulated through standard-product development and commercialization, which can be leveraged in customized projects to improve R&D efficiency, broaden application and service coverage, strengthen platform-based development capabilities and support advanced-process projects.

Our Company is an integrated provider with high R&D efficiency, comprehensive coverage capabilities and established platform-based capabilities. Its experience in the development and commercialization of proprietary standard IC products has enabled the accumulation of reusable IP, proven design platforms and engineering experience applicable to customized IC projects. In addition, advanced-process projects accounted for 75.0% of our Company's customization projects, the highest proportion among the selected providers, reflecting its comprehensive full-stack design and validation capabilities across advanced process nodes, as well as its strong supply chain collaboration capabilities.

Competitive Analysis of Major Players

Providers	Provider type	R&D efficiency	Comprehensive coverage capabilities	Platform-based capabilities	Proportion of advanced-process projects
The Company	**Product-based**	**High**	◕	◕	75.0%
Company D	Product-based	High	◕	◕	65.0%
Company H	Product-based	Medium	◕	◑	55.0%
Company I	Pure-play	Medium	◕	◑	30.0%
Company J	Pure-play	Medium	◑	◔	25.0%

Source: Frost & Sullivan

Notes:

1) ***R&D efficiency:*** *Assessed based on factors including the average time from project initiation to tape-out, first-pass tape-out success rate and revenue per R&D personnel.*

2) ***Comprehensive coverage capabilities:*** *Assessed based on factors including the number of application scenarios covered and the breadth of service processes covered.*

3) ***Platform-based capabilities:*** *Assessed based on factors including the number of supported architecture types, the size of the IP portfolio and IP reusability.*

4) ***Proportion of advanced-process projects:*** *Refers to the proportion of ongoing projects adopting 6nm and below process nodes.*

5) *Company H is a public company founded in 1995 and listed on Nasdaq, headquartered in U.S., primarily engaged in providing data infrastructure semiconductor solutions.*

6) *Company I is a public company founded in 2001 and listed on the Shanghai Stock Exchange, headquartered in China, primarily engaged in providing custom ASIC services.*

7) *Company J is an unlisted company founded in 2021 and headquartered in China, primarily engaged in providing custom ASIC services.*

Key Success Factors and Entry Barriers of ASIC Design Services Market

- ***End-to-end design, verification and tape-out execution.*** Custom ASIC projects require coordinated execution across architecture design, IP selection and integration, front-end design, physical implementation, functional verification, software adaptation and system validation, together with sustained collaboration among customers, design teams, manufacturing partners and software teams throughout extended development cycles. Strong end-to-end execution and project-management capabilities help manage technical risks, specification changes and key development milestones and improve execution and tape-out certainty.

- ***Advanced process-node design capabilities.*** Advanced-node projects impose stringent requirements across PDK adaptation, complex SoC architecture implementation, timing closure, signal integrity, thermal management and comprehensive verification. Compared with mature-node projects, they generally involve greater technical complexity, higher NRE investment and execution risks. The ability to undertake and deliver advanced-node custom ASIC projects therefore requires full-stack custom ASIC and engineering capabilities for high-performance AI computing applications, as well as close collaboration with leading foundries to access up-to-date process design kits and manufacturing support. Experience accumulated through such projects further enables providers to develop reusable know-how in advanced-node design methodologies, back-end implementation and yield optimization, while demonstrating their capabilities to meet the technical, quality and delivery requirements of high-end customers. These capabilities typically require sustained engineering investment, close supply chain collaboration and repeated silicon validation, creating meaningful barriers to entry for advanced-node custom ASIC projects.

- ***Mass-production, yield-ramp and supply-chain coordination capabilities.*** Successful tape-out represents only one stage of custom ASIC commercialization. Custom ASIC service providers need to maintain established relationships with foundry and OSAT partners and coordinate capacity, packaging and testing, yield ramp-up, quality control and cost optimization throughout volume production. Long-standing supply-chain relationships and accumulated mass-production experience can improve execution and delivery reliability and constitute important competitive capabilities

- ***Proprietary IP portfolio and reuse capability.*** Providers with established standardized chip businesses can accumulate extensive portfolios of proprietary and mass-production-validated IPs. Reuse of proven IP can shorten development cycles, reduce engineering costs and improve tape-out predictability, while such IP portfolios require sustained R&D investment and repeated commercial validation over time, creating meaningful competitive advantages and barriers to entry.

SOURCE OF INFORMATION

In connection with the **[REDACTED]**, we have engaged Frost & Sullivan to conduct a detailed analysis and prepare an industry report on the markets in which we operate (the "**Frost & Sullivan Report**"). Services provided by Frost & Sullivan include market assessments, competitive benchmarking, and strategic and market planning for a variety of industries. We have agreed to a total of RMB500,000 in fees and expenses for the preparation and use of the Frost & Sullivan Report. The payment of such an amount was not contingent upon our successful **[REDACTED]** or on the results of the Frost & Sullivan Report. Apart from the Frost & Sullivan Report, we have not commissioned any other industry report in connection with the **[REDACTED]**.

We have extracted certain information from the Frost & Sullivan Report in this section, as well as in the sections headed "Summary," "Risk Factors," "Business," "Financial Information" and elsewhere in this document to provide our potential **[REDACTED]** with a more comprehensive presentation of the industries in which we operate. Unless otherwise noted, all of the data and forecasts contained in this section are derived from the Frost & Sullivan Report, various official government publications and other publications. Frost & Sullivan prepared its report based on its in-house database, independent third-party reports and publicly available data from reputable industry organizations. Where necessary, Frost & Sullivan contacts companies operating in the industry to gather and synthesize information in relation to the market, prices and other relevant information. Frost & Sullivan believes that the basic assumptions used in preparing the Frost & Sullivan Report, including those used to make future projections, are factual, correct and not misleading. Frost & Sullivan has independently analyzed the information, but the accuracy of the conclusions of its review largely relies on the accuracy of the information collected. Frost & Sullivan's research may be affected by the accuracy of these assumptions and the choice of these primary and secondary sources.