

INDUSTRY OVERVIEW

The information and statistics set out in this section and other sections of this Document were extracted from the report prepared by Frost & Sullivan, which was commissioned by us, and from various official government publications and other publicly available publications. We engaged Frost & Sullivan to prepare the Frost & Sullivan Report, an independent industry report, in connection with the [REDACTED]. The information from official government sources has not been independently verified by us, the Sole Sponsor, [[REDACTED], [REDACTED], [REDACTED], [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.

Accordingly, you should not place undue reliance on such information. For discussions of risks relating to our industry, please see “Risk Factors — Risks Relating to Our Business and Industry.”

SOURCES AND RELIABILITY INFORMATION

In connection with the [REDACTED], we engaged Frost & Sullivan, an independent market research consultant, to conduct an analysis of, and to prepare an industry report on the markets we operate with a commission fee of RMB600,000. Founded in 1961, Frost & Sullivan provides market research on a variety of industries, among other services. The information from Frost & Sullivan disclosed in this Document is extracted from the Frost & Sullivan Report with its consent.

In compiling and preparing the Frost & Sullivan Report, Frost & Sullivan used the following key methodologies to collect multiple sources, validate the data and information collected, and cross-check each respondent’s information and views against those of others: (i) primary research, which involved in-depth interviews with the industry participants; and (ii) secondary research, which involved reviewing published sources including national statistics, annual reports of listed companies, industry reports and data based on Frost & Sullivan’s in-house research database.

Frost & Sullivan adopted the following primary assumptions while making projections for preparing the Frost & Sullivan Report: (i) China’s macro economy is expected to grow at a steady rate supported by favorable government policies as well as global economic recovery, among other factors; (ii) China’s social, economic, and political environments remain stable during the forecast period; (iii) COVID-19 pandemic is expected to affect the economy and market in the short term; and (iv) market drivers, such as increasing demands from downstream industries, advancement of technologies, favorable policies and regulations and others, are likely to drive the demand for IoT solutions and telecommunication equipment during the forecast period.

INDUSTRY OVERVIEW

Except as otherwise noted, all of the data and forecasts contained in this section are derived from the Frost & Sullivan Report. Our Directors confirm that after taking reasonable care, there has no material adverse change in the overall market information since the date of the Frost & Sullivan Report that would materially qualify, contradict or have an impact on such information.

ANALYSIS OF THE IOT MARKET IN THE PRC

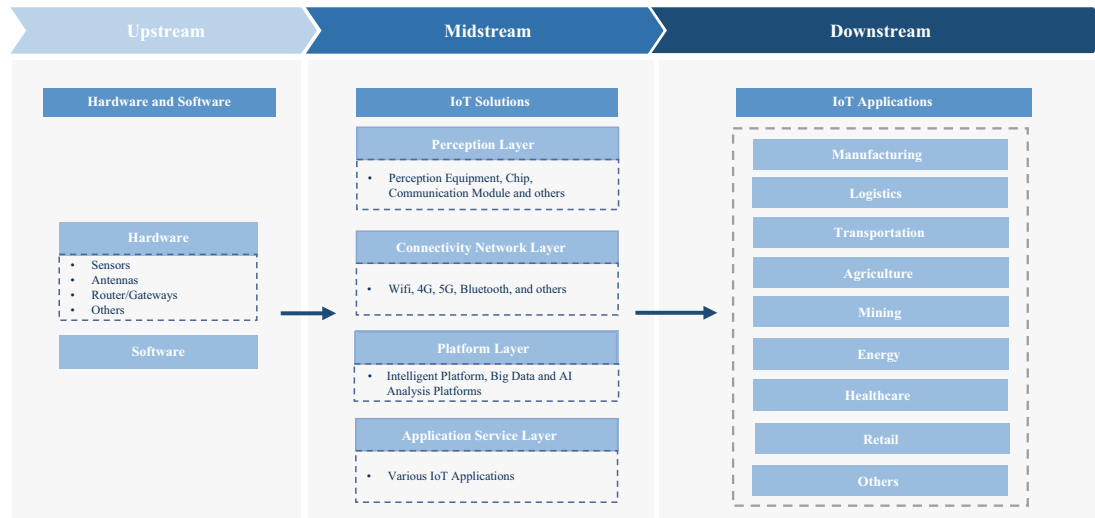
Overview

The Internet of things, or IoT, refers to a network connecting all sorts of information sensory devices to the Internet with the aim of connecting all things to the network for easy identification and management. The IoT market in the PRC consists of upstream hardware and software, midstream IoT solutions and downstream IoT applications. Among them, the upstream side is mainly composed of sensing devices and telecommunication devices, such as sensors, antennas and routers or gateways, and software, which is deployed to sensing devices and telecommunication devices for operations. As to the midstream, IoT market players aim to offer IoT solutions to their customers for addressing the connectivity of sensory devices and the collection and transformation of data. The general structure of IoT solutions includes four layers, namely perception layer, connectivity network layer, platform layer and application service layer. The perception layer is equipped with certain sensing and telecommunication devices, such as chip and communication module. The connectivity network layer is embedded between perception layer and application service layer for connecting the sensing and telecommunication devices with IoT applications in the application service layer. IoT solutions sometimes set up a platform layer between the connectivity network layer and application service layer, providing big data and AI analysis services, which is optional upon the request by customers. In the application service layer, IoT solution providers deploy various IoT applications for transforming and managing the data collected from sensing and telecommunication devices. The downstream refers to various IoT applications, mainly

INDUSTRY OVERVIEW

including manufacturing, logistics, transportation, agriculture, mining, healthcare, energy and others. The following diagram illustrates the value chain of the IoT market:

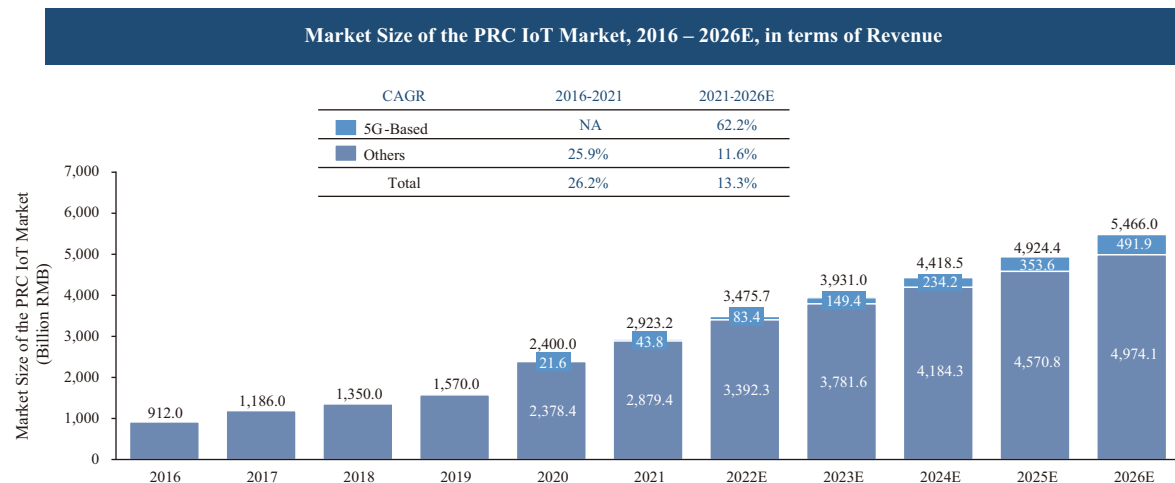
Value Chain of the IoT Market



Source: Frost & Sullivan Report

Market Size of the IoT Market in the PRC

Leveraging favorable government policies and growing introduction of the advanced technologies, the revenue of the IoT market in the PRC experienced a rapid growth with a CAGR of 26.2% from RMB912.0 billion in 2016 to RMB2,923.2 billion in 2021, and is expected to further grow at a CAGR of 13.3% from 2021 to 2026, reaching RMB5,466.0 billion in 2026.



Source: Frost & Sullivan Report

INDUSTRY OVERVIEW

Entry Barriers

The entry barriers to the IoT market in the PRC include:

- *High Technical Barriers.* The IoT market is a technology-driven industry. Technologies adopted in the IoT market are subject to continuous technical innovation, update and upgrade. Considering the specific technical requirement by IoT customers and the application scenarios, not all technologies are suitable for IoT application, and different wireless technologies have distinct roles that are suitable for IoT applications. Factors like power consumption, battery life and range of coverage should be considered as technical barriers for IoT application. Industrial IoT applications even requires higher internet speed, stability, and security of data collection and transmission. For example, low power wide area networks are specifically developed for industrial IoT applications. Leading IoT market players, who have large amount of technology patents and professional teams with technical knowledge, are able to offer comprehensive and advanced solutions services to their downstream customers. Under such circumstances, it is difficult for new entrants to gain solid technical strength and competitiveness in such a technology-driven industry.
- *Customer Base.* IoT market players strive to maintain a loyal customer base. The downstream customers mainly include enterprises, public institutions and government agencies, who have high demand and specific requirements for the quality of products and after-sales services. IoT market players aim to establish a stable and mature customer base through long-term technical services and market promotion. Besides, due to the customization of and huge investment in IoT solutions, the costs of replacement on IoT solutions are relatively high, which reinforces the customer stickiness and creates a significant barrier for new entrants to the IoT market.
- *Industry Experience.* The enterprises in the downstream industries require IoT market players to offer customized solutions according to the characteristics and development trends of the industry it operates. The downstream customers of the IoT market, especially large enterprises, also pay much attention to the proven track record of IoT market players. The IoT market players, who can fully understand customers' needs and provide high quality products as well as in-depth technical supports, are well-positioned to capture the market opportunities. New entrants without relevant project experience are likely to have some difficulties in building mutual trust with downstream customers.

INDUSTRY OVERVIEW

Market Drivers

The future growth of the IoT market in the PRC is expected to be primarily driven by the following factors:

- *Government Support.* A series of policies issued by the PRC Government, such as the *Notice on Further Implementing the Comprehensive Development of Mobile Internet of Things* (《關於深入推進移動物聯網全面發展的通知》) in 2020 and the *Industrial Internet Innovation Development Action Plan (2021-2023)* (《工業互聯網創新發展行動計劃(2021-2023年)》) in 2021, have supported the development of the IoT market. As a result, the number of mobile Internet of things connections reached 1.2 billion at the end of 2020. The supportive policies have promoted the wide applications of the Internet of things, which is expected to drive the IoT market.
- *Growing Adoption of Advanced Technologies.* The advanced technologies lay the foundation of and promote the development of the IoT market in the PRC. For example, 5G technologies, which provide ultra-low latency, multi-Gbps peak data speeds, massive network capacity, increased availability, enhanced reliability and data security, broaden the application of the IoT. Leveraging the advanced technologies adopted, IoT is expected to be applied in various industries and application scenarios to boost performance, enhance data collection and improve predictive analytics.
- *Rapid Development of Industrial IoT.* As technology advances, increasing number of factories are being automated and the importance of connectivity among the equipment in the factories is increasing. When more factories are automated, communication between machines, robots and computers will become increasingly important. With the rapid development of Industrial IoT market, manufacturing facilities will become more productive, industrial robots will become more sophisticated to handle more complex instructions, assembly lines and operations will be more streamlined and overall efficiency will increase. Industrial IoT market is the major application scenario in the IoT market. In 2021, the total revenue of industrial IoT increased to RMB548.2 billion from RMB189.3 billion in 2016. From 2021 to 2026, the total revenue of Industrial IoT market is anticipated to increase from RMB548.2 billion to RMB1,148.9 billion, with a CAGR of 16.0%. Also, the *Development Plan of a Digital Economy During the 14th Five-Year Plan (2021-25)* (《“十四五”數字經濟發展規劃》) issued by Chinese State Council in 2021 aims to reach 45% penetration rate of industrial internet platform applications by 2025. The increasing demand for factory automation and the importance of connectivity among machines, robots and computers is expected to drive the development of industrial IoT market.

INDUSTRY OVERVIEW

- *Demand for Private 5G Network.* Private 5G networks are wireless local area networks that utilize the 5G technologies as their communication medium to build private networks. These private networks offer unified connectivity with numerous advantages and optimized services. In the near future, private 5G networks are expected to become one of the preferred choices for enterprises, taking into account its vast bandwidth, high data rates, ultra-low latency, high security, reliability and scalability features. This is a game-changer for enterprises and industries, where private 5G networks are essential connection methods, such as autonomous vehicles, connected factories, connected healthcare, smart retail, and rural broadband connectivity. The developers of private 5G network also aim to cope with the huge rise in demand for the digital transformation of enterprise. Enterprises that require network slicing capabilities to separate mission-critical use cases within the same physical network will turn to adopt private 5G networks. China has adopted a positive approach toward popularizing the private 5G networks, which is anticipated to bring more opportunities to the IoT market players.

Future Trends

- *Initiatives on Smart City Construction from Governments.* Smart city is one of the primary application scenarios of IoT solutions. A smart city is a technologically modern urban area that uses various types of telecommunication methods, voice activation methods and sensors to collect specific data. Information gained from that data are used to manage assets, resources and services efficiency; in return, that data is used to improve the operations across the city. The smart city concept integrates information and communication technology, and various physical devices connected to the IoT network to optimize the efficiency of city operations and services and connect to citizens. The PRC Government has implemented a series of policies to regulate and support the development of smart city, including the *Implementation of the Urban Renewal Initiative* (《實施城市更新行動》) issued by the Ministry of Housing and Urban-Rural Development in 2021. Leveraging the support from the PRC Government, the construction of smart city is expected to accelerate, which will further promote the development of the IoT market.
- *Extensive Application of IoT Solutions.* The demand of digital transformation experiences a tremendous increase in various domains. IoT solutions take place in a wider array of scenarios, involving not only manufacturer in industrial engineering, but also enterprises in other industries requiring broadband and high transmission speed, such as retail, agriculture, financial services, automotive and healthcare. In the future, the extensive application of IoT solutions is expected to bring more development opportunities for the market players in the PRC.

INDUSTRY OVERVIEW

- Adoption of Big Data Analysis Platforms.* The operation of IoT solutions involves collecting the massive amounts of data. The increase in the amount of data poses serious challenges to the collection, storage and analysis of these data. IoT solutions are expected to adopt new advanced analysis tools for processing and analyzing the large amounts of the data collected, where the adoption of big data and artificial intelligence analysis platforms is expected to be popularized.
- Network Security Risks.* With the development of wireless communication network and the deployment of IoT, people are easy to connect with wireless network and share massive amount data within the network and system deployed. As a result, a slew of new cyber threats has emerged. Malicious attacks have surged with the increasing adoption of IoT and wireless technologies. In particular, many enterprises are exposed to the network security risks and they are inclined to protect their database and prevent data leakage by setting up their own private 5G networks.

Competitive Landscape of the IoT Market in the PRC

The IoT market in the PRC is competitive and fragmented with more than 30,000 participants. There are many market participants join the competition in each layer of the IoT market in the PRC. The major participants in the IoT market include domestic and foreign companies, some of which are globally well-known large-scale and multinational enterprises. The diagram below sets forth the the backgrounds and market shares of the top ten IoT market participants in the PRC by revenue in 2021:

Ranking	Company	Background Information	Market Share (%)
1	Company A	A leading global provider of information and communications technology (ICT) infrastructure and smart devices.	7.2%
2	Company B	A world-leading provider of better life and digital transformation solutions, focusing on the business of smart home and living, industrial internet and great healthcare.	4.1%
3	Company C	A listed leading technology company with smartphones, IoT products and internet business at its core.	2.9%
4	Company D	A world-leading provider of innovative security products and solutions.	1.9%
5	Company E	A partially state-owned Chinese technology company that specializes in telecommunication and information technology.	1.1%
6	Company F	A listed IoT company providing smart products and professional services for information interaction and human health in the PRC.	1.0%
7	Company G	A listed world-leading video-centric smart IoT solution and service provider.	1.0%
8	Company H	A leading technology company that focuses on the IoT business, including VloT, AIoT, and IIoT in the PRC.	0.4%
9	Company I	A leading technology company that focuses on the integration of computer information systems and software development related to communications and information operations.	0.2%
10	Company J	A listed well-known intelligent speech and artificial intelligence company in the Asia-Pacific Region.	0.2%
Top 10			20.0%
Others			80.0%
Total			100.0%

Source: Frost & Sullivan Report

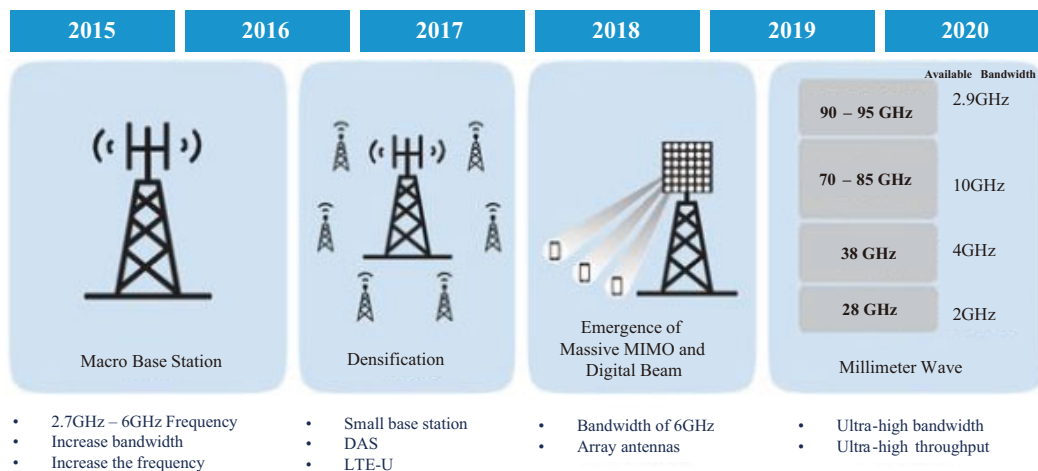
INDUSTRY OVERVIEW

In 2021, our Group occupied approximately 0.006% market share of the IoT market in the PRC.

Analysis of the Private 5G Network Market and its Impact on the IoT Market in the PRC

Overview

5G is the 5th generation mobile network. The 5G technology was first defined in a 2015 white paper published by The Next Generation Mobile Networks (NGMN) Alliance. Between 2015 and 2016, 5G technology went through testing and pre-studying. In 2017, 3GPP set up the standards for 5G, and the technology trials began, which accelerated the development of supplementary technology, such as DAS, LTE-U. In 2018, massive MIMO and digital beam were developed to enhance the signal of 5G and meet the end user's needs. The frequency of 5G reached to 6GHz. The Sub-6GHz frequency bands and the millimeter wave spectrum are two frequency specifications defined and used for 5G technology. Sub-6GHz refers to mid and low-frequency bands under 6GHz, and millimeter wave refers to higher frequency radio bands over 24GHz with a wavelength of less than 10mm. Currently, the Sub-6GHz is the most commonly used in 5G technology in the PRC. As for 2020, the millimeter wave was suggested for possible integration with 5G technology, with its ultra-high bandwidth and ultra-high throughput. Nonetheless, the millimeter wave communication technology in the PRC is still in the R&D stage. It has not yet been commercialized and has not yet been applied to 5G technology in the PRC so far.



Source: Frost & Sullivan Report

5G technologies are meant to deliver higher multi-Gbps peak data speeds, ultra-low latency, more reliability, massive network capacity, increased availability, and a more uniform user experience to more users. Up to 100 times faster than 4G, 5G is creating never-before-seen opportunities for people and businesses. In particular, 5G accelerated the expansion of IoT application scenarios, such as consumer applications and industrial applications. Since 2020, 5G technologies have been introduced for commercial use.

INDUSTRY OVERVIEW

As compared with the standards of previous generations, 5G standard is a much more unified standard across the world. 5G was initially introduced in 2018 by the freezing of 3GPP’s Release 16 (5G phase II), which has been commonly adopted by the member countries of the 3GPP (3rd Generation Partnership Project).

The IoT market is expected to benefit from the high transmission speed and low latency of 5G technologies. By breaking through the capabilities of the 4G technologies, 5G technologies create a friendly ecosystem for IoT with faster speed, higher bandwidth and lower latency as compared to 4G technologies. The total revenue of 5G-based IoT solutions in the PRC is expected to increase from RMB43.8 billion in 2021 to RMB491.9 billion in 2026, with a CAGR of 62.2% from 2021 to 2026.

The value chain of private 5G network market in the PRC includes upstream manufacturers of components of telecommunication equipment; midstream manufacturers of 5G micro base station, 5G core network, 5G aggregation network and solution providers; and end users in the downstream application scenarios, which include government entities, military units, police, corporate and others.

The private 5G network solutions that we offered cover production of 5G base stations for our customers and do not rely on any existing 5G base stations in the PRC.

Favorable Government Initiatives and Policies to Promote Private 5G Network in the PRC

In 2021, the number of 5G base stations per 10,000 people reached 10.1 in the PRC. In order to accelerate the development of the 5G industry, the PRC government issued several favorable policies. According to the *5G Application “Sailing” Action Plan (2021-2023)* (《5G應用“揚帆”行動計劃(2021-2023年)》), the average annual growth rate of 5G IoT end users will exceed 200%, and every 10,000 people in the PRC will enjoy more than 18 5G base stations as the country steps up efforts to improve 5G coverage by 2023. The PRC government also claims that each key industry creates more than 100 5G application benchmarks, and will have a 35% penetration rate of 5G applications in the industrial industry by 2023, while more than 3,000 virtual private 5G networks will be set up by 2023. As of July 2022, the number of virtual private networks in the 5G industry had reached 6,518.

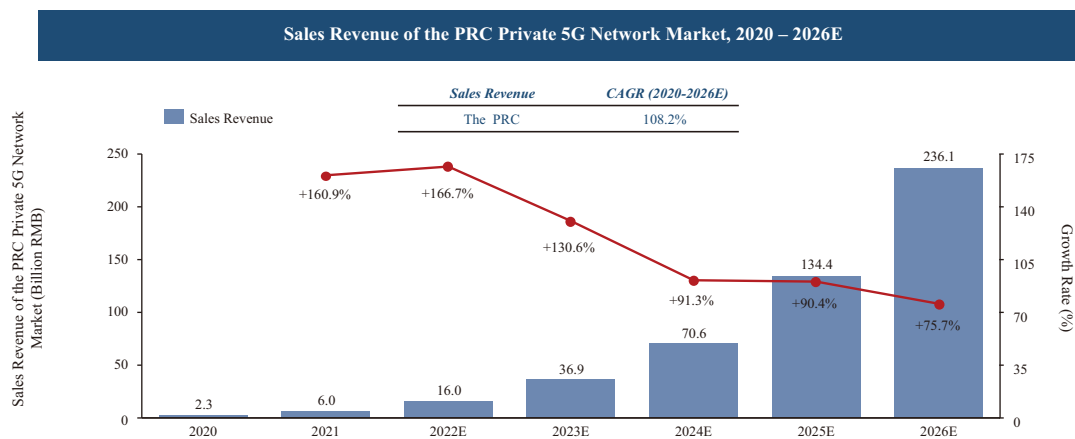
To achieve those goals, the government stated the following initiatives: (i) improving 5G application support capabilities. The government encourages the industry giants in the telecommunication industry, the information and communication technology industry, and other related industries to combine their strengths to develop integrated 5G applications. Specifically, leading telecommunication operators are encouraged to accelerate the construction of 5G networks and expand the urban and rural coverage of 5G network, leading telecommunication tower infrastructure service providers are encouraged to enhance the deployment density of 5G base stations, and leading information and communication technology enterprises are encouraged to develop advanced 5G technologies in various industries; (ii) establishing the 5G application standards system; and (iii) enabling 5G applications in key fields, including smart logistics, smart mining, smart agriculture, and others.

INDUSTRY OVERVIEW

Market Size of Private 5G Network in the PRC

The private 5G network market has been generating revenue in the PRC since 2020. The total revenue of the private 5G network market in the PRC was RMB2.3 billion in 2020. The private 5G network market accounted for about 0.2% of the IoT market in the PRC in 2021, with a total revenue of RMB6.0 billion. With the acceleration of digital transformation in various industries, the total revenue of the private 5G network market in the PRC is expected to reach RMB236.1 billion in 2026, with a CAGR of 108.2% from 2021 to 2026.

The diagram below sets forth the sales revenue of the private 5G network market in the PRC for the years indicated:



Source: Frost & Sullivan Report

Future Trends

- Development of Emerging Technologies.** The development of 5G applications provides huge opportunities to the private 5G network market. With the expansion of 5G application scenarios, new application scenarios such as industrial IoT, which require high multi-Gbps peak data speeds, ultra-low latency, reliability and high security, increase the demand for private 5G network. The private 5G network is committed to optimizing the product performance by providing high-speed, reliable and secured network. For example, massive MIMO in 5G micro base station, as a core technology in the private 5G network, is developed to enhance spectrum efficiency and system capacity. In the future, the development of emerging technologies is expected to broaden the downstream applications of private 5G network and further drive the rapid development of private 5G network market.

INDUSTRY OVERVIEW

- *Increasing Demand for Private 5G Network.* In the future, 5G networks can support various scenarios of intelligent manufacturing, such as the coordinated control of robotic arms, which require the extremely low millisecond latency, the high bandwidth and advanced production assistance systems when applying augmented reality. With the awareness of data security and requirements for low latency in data processing, increasing number of enterprises are expected to build their own private 5G networks with the characteristics of low cost and easy deployment, which will become an important part of enterprises’ network coverage plan.
- *Integration of Micro Base Stations in Private 5G Network and Edge Computing.* The continuous exploration of 5G application scenarios will create a huge demand for edge computing, which refers to a distributed computing framework that brings applications closer to data sources, such as IoT devices or local edge servers. The edge data center is close to the information source and can perform simple data processing locally, which reduces network latency, expedites feedback, improves user experience and reduces network congestion to a great extent. The micro base stations in private 5G network are highly compatible with edge computing platforms in terms of high density, easy deployment, self-optimization, and low cost. The increase in demand for edge computing is expected to promote the sales of 5G micro base stations, and accelerate the development of private 5G networks.
- *Insufficient Talents.* With the popularization of emerging technology in 5G network, there is an increasing demand for professional talents in research and development, engineering application as well as operation and management in both 5G network, IoT industry and relative vertical industries. As 5G and IoT are newly emerged industries, there is a relatively large gap between the market demand and talent supply. Besides, the relevant education and skill training may not be able to catch up with the fast development of 5G and IoT industries.

INDUSTRY OVERVIEW

Competitive Landscape of the Private 5G Network Market in the PRC

The private 5G network market in the PRC is concentrated and dominated by a few market leaders. There were only about 20 participants in the private 5G network market in the PRC in 2021. In 2021, the total revenue of top ten participants accounted for approximately 96.3% of the total revenue of private 5G network market in the PRC.

In 2021, our Group’s revenue generated from both private 5G network solutions and products amounted to RMB72.9 million, ranking the eighth among all market players with a 1.2% market share. In addition, our Group’s business covered connectivity network layer and platform layer. The private 5G network business of the telecommunication giants is more focused on large-scale projects, such as installing private 5G networks for government, military, and infrastructure, while other top players can cater to more diverse business needs. For example, our Group strategically focus on providing cost-effective and customized IoT solutions and telecommunication equipment to enterprises with higher management flexibility and shorter product delivery period as compared to other large-sized major participants.

Ranking of Participants in the PRC Private 5G Network Market, 2021

Ranking	Company	Background Information	Market Share (%)
1	Company A	A leading global provider of information and communications technology (ICT) infrastructure and smart devices.	62.0%
2	Company E	A partially state-owned Chinese technology company that specializes in telecommunication and information technology.	19.1%
3	Company K	A leading global system provider for end-to-end communications solutions and telecom infrastructures.	4.8%
4	Company L	A large-scale state-owned high-tech enterprise in the PRC, specializing in 5G technical development.	2.7%
5	Company M	A leading information and communication network product and solution provider in China.	2.4%
6	Company N	An industry leader in the provision of digital solutions in China, offers a full portfolio of digital infrastructure products and provides a comprehensive one-stop digital platform.	1.6%
7	Company O	A global leading solution and service provider of wireless and information communications systems with its R&D facilities, manufacturing base, and sales and service.	1.4%
8	Our Group	See “Business”	1.2%
9	Company P	A leading global provider of professional communications technologies and solutions in communications industry.	0.7%
10	Company Q	A leading software company of 3G/4G/5G core network with flexible development, customized services and end-to-end mobile core solution.	0.4%
Top 10			96.3%
Others			3.7%
Total			100.0%

Source: Frost & Sullivan Report

INDUSTRY OVERVIEW

ANALYSIS OF THE TELECOMMUNICATION EQUIPMENT MARKET IN THE PRC

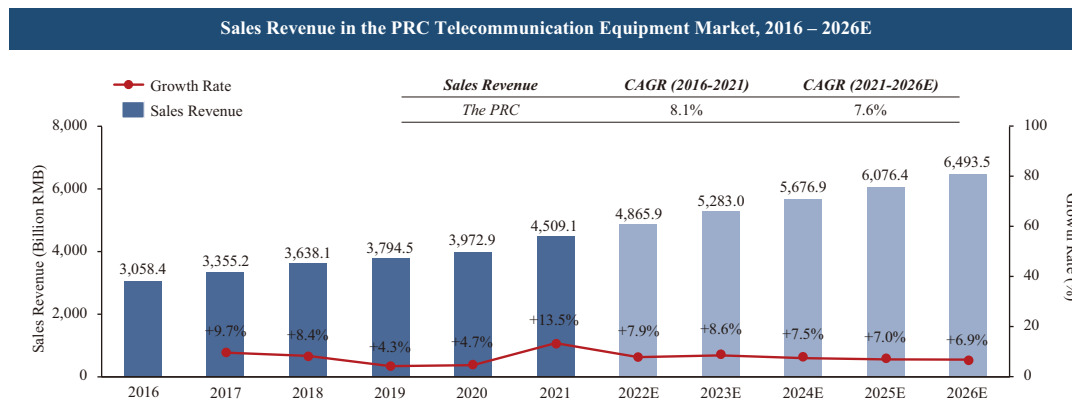
Overview

The telecommunication equipment includes a much broader range of equipment with more sophisticated devices and more embedded functions as technology evolves. The telecommunication equipment can be classified as (i) telecommunication system equipment and (ii) telecommunication terminal equipment. The telecommunication system equipment mainly includes wired and wireless communication transmission equipment, such as modems, routers, circuit switches, and others, while the telecommunication terminal equipment mainly includes mobile communication equipment, such as mobile phones, wearable devices and others.

Market Size of the Telecommunication Equipment Market in the PRC

From 2016 to 2021, the sales revenue in telecommunication equipment market in the PRC experienced a stable growth, increasing from RMB3,058.4 billion to RMB4,509.1 billion, with a CAGR of 8.1%, and is expected to reach RMB6,493.5 billion in 2026, representing a CAGR of 7.6% from 2021 to 2026.

The diagram below set forth the total revenue of the telecommunication equipment market in the PRC for the years indicated:



Source: Frost & Sullivan Report

INDUSTRY OVERVIEW

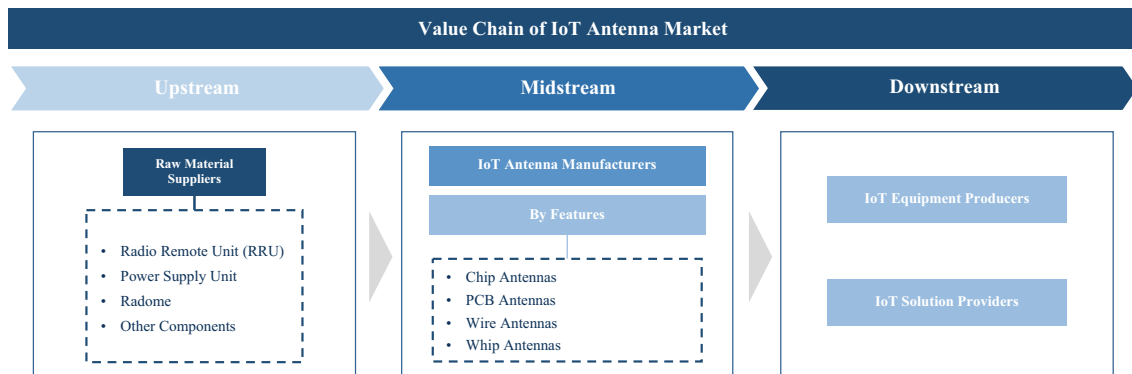
ANALYSIS OF THE IOT ANTENNAS MARKET IN THE UNITED STATES

Overview

The antenna is the tool by which an IoT device receives and broadcasts signals to the outside world and therefore is a fundamental element of an IoT device. IoT antennas enable fast and easy integration into connected systems, such as Wi-Fi, Bluetooth, Zigbee and WLAN devices.

The IoT antenna products can be divided into radio frequency identification (“**RFID**”) antennas, wearable or implantable antennas, on-chip package antennas, multi-physical sensing antennas and energy harvesting antennas by function; and chip antennas, PCB antennas, wire antennas and whip antennas by type.

The value chain of IoT antenna market generally includes upstream raw material suppliers, midstream IoT antenna manufacturers, and downstream IoT equipment producers and IoT solution providers. The diagram below sets forth the value chain of the IoT antenna market:



Source: Frost & Sullivan Report

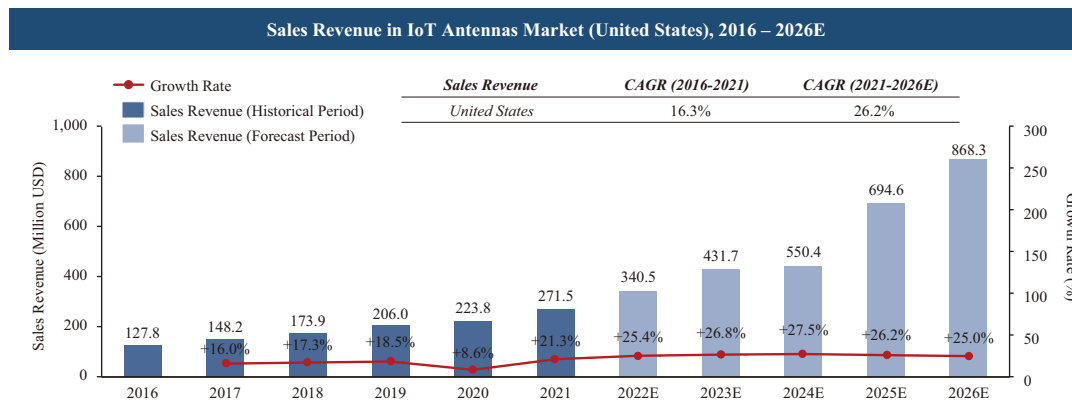
INDUSTRY OVERVIEW

Market Size of IoT Antennas Market in the United States

Due to the rapid development of IoT market, the total sales revenue of IoT antennas market in the United States experienced a continuous growth in recent years, which increased from USD127.8 million in 2016 to USD271.5 million in 2021, representing a CAGR of 16.3% from 2016 to 2021.

The IoT market in the United States will continue to be driven by a number of innovations in technology through research and development efforts, acquisitions by large players to gain foothold in the IoT market and strong synergy between market players to develop industry standards to govern platform architecture and protocol. Driven by the rapid development of 5G technologies in the United States with more than 280 cities covered by 5G network, and the favorable policies to support the development of IoT industry, such as the “*Infrastructure Investment and Employment Act*” issued by the United States Congress, which allocates a total funding of USD550.0 billion in infrastructure investment covering roads, bridges, water supply, broadband and power grid, the sales revenue of IoT antennas market in the United States is expected to witness a significant growth since 2021. As such, the total sales revenue of IoT antennas market in the United States is expected to reach USD868.3 million in 2026, with a CAGR of 26.2% from 2021 to 2026.

The diagram below sets forth the sales revenue of IoT antennas market in the United States for the years indicated:



Source: Frost & Sullivan Report

INDUSTRY OVERVIEW

Future Opportunities

- *Increasing Investment in Infrastructure Further Stimulates Demand for IoT Antennas.* In August 2021, the United States Congress approved the *Infrastructure Investment and Employment Act*, which proposed to allocate a total funding of USD550.0 billion in infrastructure investment covering roads, bridges, water supply, broadband and power grid. The increasing investment in broadband and power grid is expected to further stimulate the downstream demands for IoT antennas, which will promote the development of the IoT antennas market in the United States in the future.
- *Diversified and Complex Product Applications.* Along with the development of IoT industry, the expanding applications of IoT devices and use cases, combining with additional radio spectrum and protocols, are creating more complexity in designing and integrating antennas into products. Moreover, diversified and complex product application puts forward high requirements for IoT antennas on electrical characteristics, structural complexity and manufacturing process. For example, RFID antennas may work in the environment with further limited volume and more complex propagation characteristics, which raises high requirements for the miniaturization and broadband design. Therefore, IoT antenna producers have to improve their R&D capability to satisfy the evolving requirements from diversified and complex product applications.
- *Development of IoT Antenna System.* As the IoT ecosystem turns to support high-density and low latency networks, and continues to incorporate various new features into radios and overall system layouts, the antenna system plays a more important role in IoT solutions. Therefore, the IoT antenna producers not only regard IoT antennas as ancillary products to communication modules, but also develop IoT antenna systems as an indispensable solution for establishing IoT applications and intelligent environments. With the development of IoT antenna market in the United States, the IoT antenna producers, especially those leading ones, have been dedicated to providing comprehensive antenna solutions to IoT solution providers that lack of the skills to tackle inherent technological complexity of antenna design.
- *Intensified Competition.* As the wide application of IoT promotes the development of new-generation information technology, the increasing number of telecommunication product manufacturers, including antennas, electronic component and communication modules producers, has been participating in this market, intensifying the competition. Those small and medium-sized IoT antenna producers who serve mid- and low-end customers may face price competition, which may reduce their profitability.

INDUSTRY OVERVIEW

Competitive Landscape of the IoT Antenna Market in the United States

Most of the United States’ IoT antenna brands outsourced their production to overseas original equipment manufacturers (“OEM”), such as OEMs in the PRC, and conducted product sales through both direct sales and distributors. There is a large number of OEMs in the PRC that manufacture IoT antennas for the United States’ market. Therefore, the market shares of these OEMs in the PRC are rather fragmented.

The diagram below sets forth the backgrounds and market shares of the top ten PRC exporters in the U.S. IoT antenna market:

Ranking	Company	Background Information	Market Share (%)
1	Company R	A developer and producer of various electronic components and modules related to RF, such as antenna modules, wireless charging modules, EMC/EMI products, and others.	12.6%
2	Company S	A global designer and manufacturer of cable assembly and connector system solutions for consumer, enterprise, cloud, automotive, and medical applications.	10.8%
3	Company T	A leading company in global mobile communication industry.	8.0%
4	Company U	A leading company specialized in research and development, manufacture and sales of terminal antennas for wireless communications.	6.3%
5	Company V	A company that focuses on main businesses including mobile communication equipment and elevator manufacture.	4.0%
6	Company O	A global leading solution and service provider of wireless and information communications systems with its R&D facilities, manufacturing base, and sales and service teams.	1.7%
7	Company W	A leading listed company that specialized in antenna, radio frequency, communications products, and solutions of Cloud WiFi series.	1.1%
8	Our Group	See “Business”	0.9%
9	Company X	A listed large high-tech enterprise providing wireless access system solutions.	0.6%
10	Company Y	A leading private IoT antenna supplier in China.	0.3%
Top 10			46.3%
Others			53.7%
Total			100%

Source: Frost & Sullivan Report

In terms of sales revenue derived from IoT antennas in 2021, our Group accounted for approximately 0.9% in the IoT antenna market in the United States.

INDUSTRY OVERVIEW

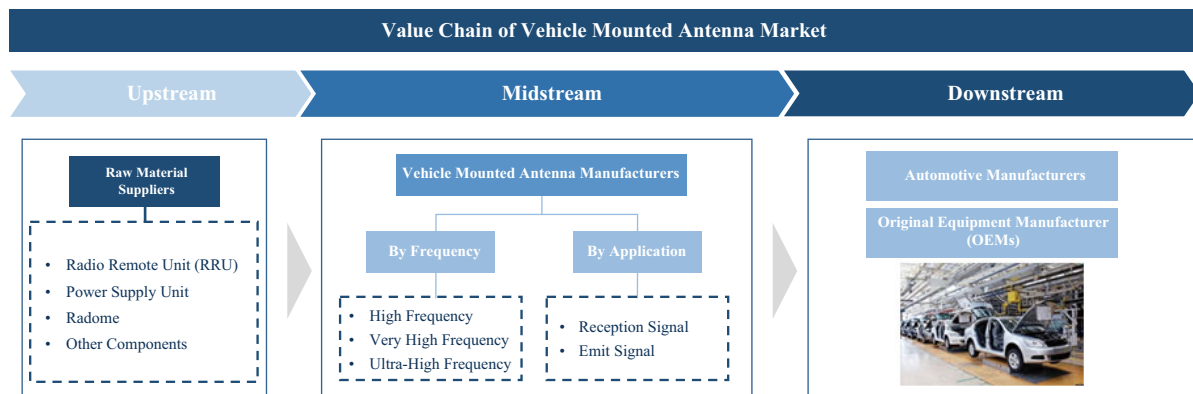
ANALYSIS OF THE VEHICLE MOUNTED ANTENNA MARKET IN RUSSIA

Overview

The vehicle mounted antennas are used for identifying spatial signal signatures, such as the direction of arrival (“DOA”) of the signal, and calculating beamforming vectors, which are used for tracking and locating the antenna beam on the vehicle. The automotive industry is transitioning to smart automobiles, which are fully connected via vehicle-to-infrastructure (“V2I”) and vehicle-to-vehicle (“V2V”) communication to enhance safety and performance. The vehicle mounted antenna plays an important role in smart automobiles as it links various services, such as mobile communication, GPS, TV, radio and others.

The vehicle mounted antenna products can be divided into high frequency (0-800 MHz), very high frequency (800 MHz-2.5 GHz), and ultra-high frequency (2.5 GHz-6 GHz) by frequency; reception signal and emit signal by application; and light duty vehicle, commercial vehicle, and electric vehicle by vehicle type.

The value chain of vehicle mounted antenna market generally includes upstream raw material suppliers, midstream vehicle mounted antenna manufacturers, and downstream automotive manufacturers and OEMs. The diagram below sets forth the value chain of the vehicle mounted antenna market:



Source: Frost & Sullivan Report

Market Size of the Vehicle Mounted Antenna Market in Russia

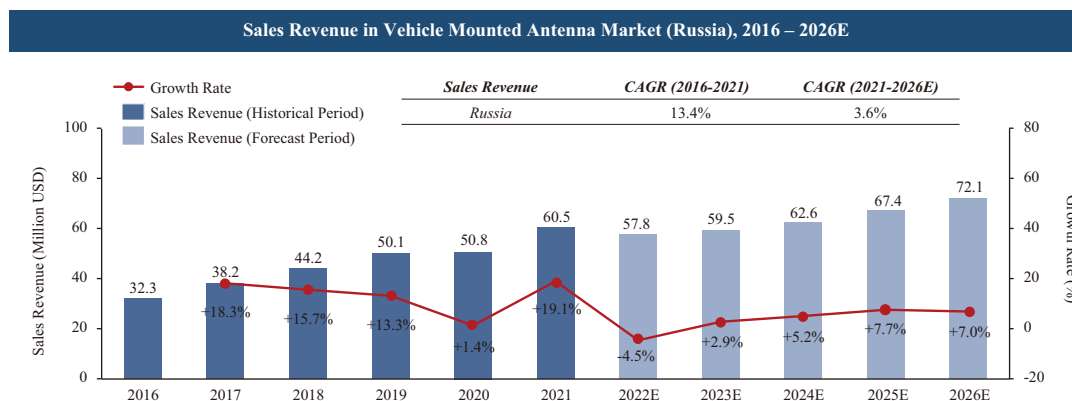
Along with the increasing production volume of vehicles and the growing application of diversified vehicle mounted antennas in Russia, the total sales revenue of the vehicle mounted antenna market in Russia increased from USD32.3 million in 2016 to USD60.5 million in 2021, with a CAGR of 13.4% from 2016 to 2021.

In 2020, the growth rate of the sales revenue of the vehicle mounted antenna market in Russia was only 1.4% primarily because the production volume of vehicles decreased by 16.5%

INDUSTRY OVERVIEW

from 2019 to 2020 due to the outbreak of COVID-19 pandemic. In 2021, the production volume of vehicles in Russia has witnessed a quick rebound by 9.1%. Moreover, in September 2021, the Russian government planned to provide subsidies with 25% of purchase price of any Russian-made electric vehicle to a maximum amount of USD8,570, to stimulate demands and production of electric vehicles. Therefore, the sales revenue of the vehicle mounted antenna market in Russia in 2021 experienced a significant increase by 19.1%, reaching USD60.5 million in 2021. The Russia-Ukraine war and economic sanctions starting in 2022 are expected to become obstacles to the growth of Russia’s automobile industry. Although the demand for the vehicle mounted antennas from vehicles of domestic brands in Russia increases, the growth of the vehicle mounted antennas market in Russia is likely to slow down in the future. The total sales revenue in the vehicle mounted antennas market in Russia is anticipated to reach USD72.1 million in 2026, representing a CAGR of 3.6% from 2021 to 2026.

The diagram below sets forth the sales revenue of the vehicle mounted antenna market in Russia for the years indicated:



Source: Frost & Sullivan Report

Future Opportunities

- The Potential Development of Internet of Vehicles.* The Internet of Vehicles (“IoV”) uses the network infrastructure to allow vehicles to be connected to new radio technologies, which can be supported by 5G networks. Within the IoV, the vehicles can create and share digital information between infrastructures, such as Vehicular Cloud, organizations, and other vehicles. Along with the wide application of the IoV, the industrialization process of 5G+V2X will be accelerated, which will promote the development of vehicle-mounted communication equipment to adapt the new standard level of vehicles. As such, the potential development of IoV is expected to further stimulate the development of vehicle-mounted communication equipment.

INDUSTRY OVERVIEW

- *Increasing Demand for Electric Vehicles (“EV”).* The demand for EVs is expected to increase in the coming years due to the favorable subsidy policies and the adoption of strict emission policies by the governments of various countries. In September 2021, the Russian government plans to grant subsidies that cover 25% of the purchase price of any Russian-made electric vehicle to a maximum amount of USD8,570, to stimulate demand and production of EVs. In addition, toll roads in Russia are expected to be free for EVs. These favorable policies on EVs attract more foreign automakers to produce EV models in Russia. Russia aims to achieve 220,000 units of annual production of EV in 2030.
- *The Development of Autonomous Vehicles.* Leading technology players and automakers have been increasing their investments in the development of autonomous vehicles during the recent years. Autonomous vehicles are expected to benefit us in various aspects, such as reducing accident rates and increasing productivity at workplace. The development of autonomous vehicles stimulates the digital transformation of vehicles, in which the vehicle mounted antenna plays an important and fundamental role. As such, the digital transformation of vehicles is expected to boost the demand for vehicle mounted antennas.
- *Rising Manufacturing Cost.* The demand for vehicle mounted antennas is expected to grow due to the rapid technological upgrade and market needs. However, the high manufacturing and maintenance costs are estimated to restrain the growth of the vehicle mounted antenna market, especially as the vehicle mounted antenna market is still in its early stage of the development. In addition, with the rise of wage standard, the labor costs are expected to continue to increase, which may reduce manufacturers’ profit.

INDUSTRY OVERVIEW

Competitive Landscape of the Vehicle Mounted Antenna Market in Russia

The vehicle manufacturers in Russia are primarily overseas brands, which accounted for over 60% of the total production volume of vehicles in Russia in 2021. The vehicle manufacturers of international brands generally establish the stable supplier systems of vehicle components, including vehicle mounted antennas. Meanwhile, the vehicle mounted antenna brands in Russia generally outsourced their production to OEMs, such as OEMs in the PRC. The market shares of OEMs in the PRC that manufacture vehicle mounted antennas for Russia’s market are relatively fragmented.

The diagram below sets forth the backgrounds and market shares of the top ten PRC exporters in the Russian vehicle mounted antennas market:

Ranking	Company	Background Information	Market Share (%)
1	Company R	A developer and producer of various electronic components and modules related to RF, such as antenna modules, wireless charging modules, EMC/EMI products, and others.	11.5%
2	Company S	A global designer and manufacturer of cable assembly and connector system solutions for consumer, enterprise, cloud, automotive, and medical applications.	10.5%
3	Company T	A leading company in global mobile communication industry.	9.5%
4	Company U	A leading company specialized in research and development, manufacture and sales of terminal antennas for wireless communications.	8.2%
5	Company V	A company that focuses on main businesses including mobile communication equipment and elevator manufacture.	7.2%
6	Our Group	See “Business”	6.2%
7	Company X	A listed large high-tech enterprise providing wireless access system solution.	5.1%
8	Company Z	One of the largest antenna manufacturers in China.	1.5%
9	Company AA	A listed company that focuses on communication antenna, automotive electronics, and high-performance RF devices.	1.0%
10	Company AB	A professional automotive antenna and feeder manufacturer integrating design, production and sales.	0.8%
Top 10			61.5%
Others			38.5%
Total			100%

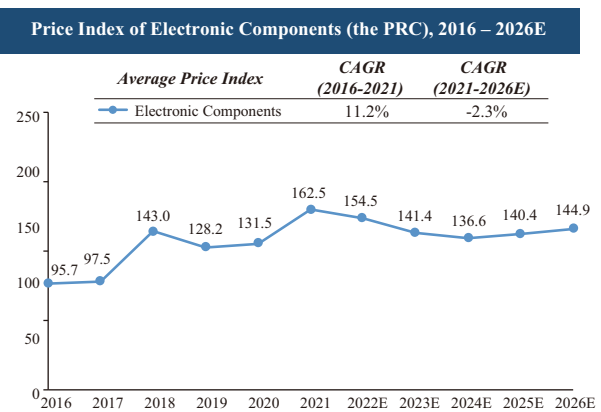
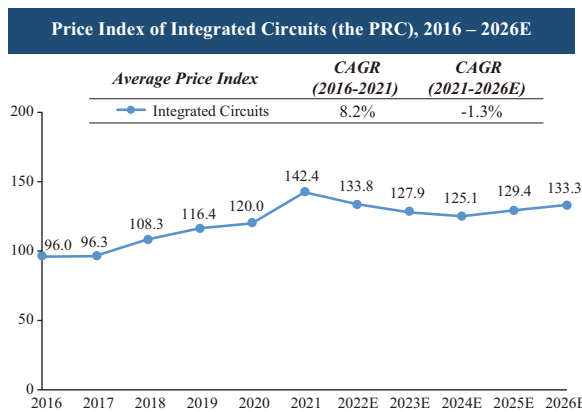
Source: Frost & Sullivan Report

In terms of sales revenue derived from vehicle mounted antennas, our Group accounted for approximately 6.2% of the vehicle mounted antennas market in Russia.

INDUSTRY OVERVIEW

MAJOR MATERIALS AND COMPONENTS

Affected by the outbreak of COVID-19 pandemic, the production volume of integrated circuits decreased due to the lockdown of manufacturing sites for a period. However, electronic product manufacturers increased their inventory of integrated circuits resulting from the trust crisis in global supply chain, whilst the growing scenarios of working and studying at home and the recovery of economic activities from the COVID-19 pandemic stimulated high demand for electronic products, which accordingly increased the demand for integrated circuits. Therefore, in 2021, global market faced the shortage in supply of integrated circuits, which resulted in an increase of average integrated circuit price as of December 31, 2021 by approximately 20% compared with the average price in 2020. Primarily due to the same reason, the average price of electronic components experienced similar fluctuations for the same periods as that of integrated circuits.

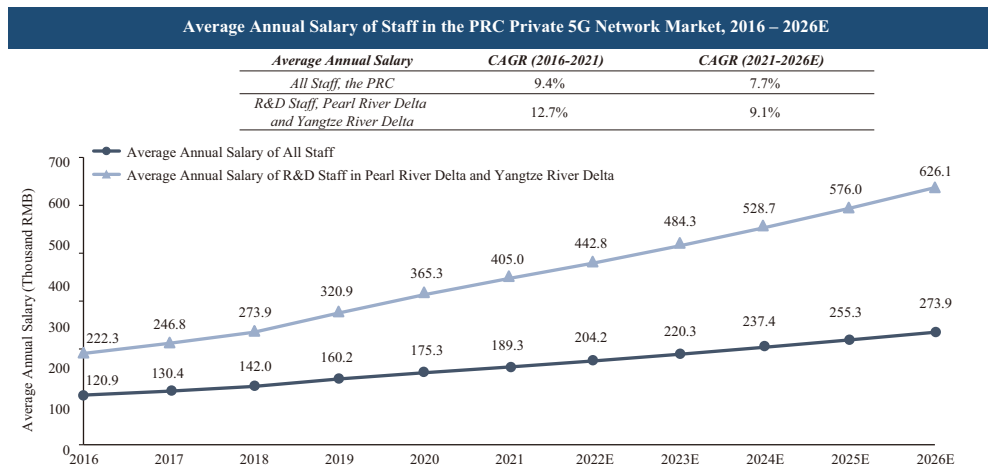


Note: Base=100: weighted average price of selected products during the period from 11 August 2007 to 17 August 2007.

Source: Frost & Sullivan Report

INDUSTRY OVERVIEW

From 2016 to 2021, the average annual salary of staff in the PRC private 5G network market experienced a rapid growth. The average annual salary of all staff in the PRC is increasing from RMB120.9 thousand in 2016 to RMB189.3 thousand in 2021, representing a CAGR of 9.4%. While the average annual salary of R&D staff in Pearl River Delta and Yangtze River Delta increased from RMB222.3 thousand in 2016 to RMB405.0 thousand in 2021, with a CAGR of 12.7%. In the future, the average annual salary of staff in the private 5G network market is expected to maintain a steady growth. The average annual salary of all staff in the PRC is expected to reach RMB273.9 thousand in 2026, with a CAGR of 7.7%. While the average annual salary of R&D staff in Pearl River Delta and Yangtze River Delta is anticipated to reach RMB626.1 thousand in 2026, with a CAGR of 9.1%.



Source: Frost & Sullivan Report