

## INDUSTRY OVERVIEW

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Our Group had commissioned Frost & Sullivan to provide information on the global electronics market and the electronics manufacturing service market in the PRC. We had agreed to pay a fee of RMB560,000 to Frost & Sullivan for the report. Our Directors are of the view that the payment does not affect the fairness of the views and conclusions presented in the Frost & Sullivan Report, company reports, independent research reports and data based on its own research database.

### RESEARCH METHODOLOGY

In compiling and preparing the Frost & Sullivan Report, Frost & Sullivan conducted primary research including interviews with industry experts and participants and secondary research which involved reviewing the statistics published by the government official statistics, industry publications, annual reports and data based on its own database. Frost & Sullivan presented the figures for various market size projections from historical data analysis plotted against macroeconomic data, as well as data with respect to the related industry drivers and integration of expert opinions. Frost & Sullivan assumed that in the PRC: (1) the economy is likely to maintain steady growth in the next decade; (2) the social, economic and political environment is likely to remain stable in the forecast period, which ensures the stable and healthy development of electronics manufacturing service industry; and (3) there will be no wars or large scale disasters during the forecast period.

### ABOUT FROST & SULLIVAN

Frost & Sullivan is an independent global consulting firm founded in 1961. It offers industry research, market strategies and provides growth consulting and corporate training in various industries. The Frost & Sullivan Report includes information on data of the global electronic products market and the PRC electronics manufacturing service market.

### OVERVIEW OF ELECTRONIC PRODUCTS MARKET IN THE PRC

#### Definition and Classification of Electronic Products

An electronic product is a manufactured or assembled product which contains or functions as part of an electronic circuit. According to various application areas, electronic products can be categorized as following:

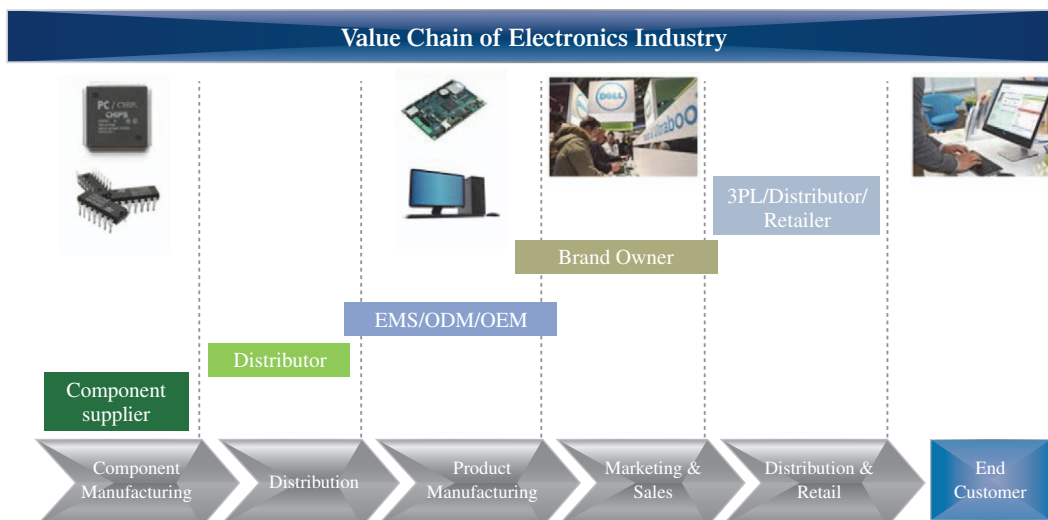
- *Computer and storage:* Computer and storage products generally include computers and related accessories and parts such as keyboards, mice, storage devices, and etc.

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- *Telecommunications:* Telecommunication products generally refer to various devices that enable communication between different parties over distance, such as mobile phones, telephones, radios, transmission equipment, and etc.
- *Automotive electronics:* Automotive electronics refer to electrically-driven components used in vehicles and are generally categorized into four systems, namely body control system, power-train system, safety system and infotainment system.
- *Consumer electronics:* Consumer electronics refer to electronic products intended for purchase and use by consumers, rather than for industrial purposes, such as DVDs and MP3 players, stereo components, cameras, smart devices, and etc.
- *Industrial electronics:* Industrial electronics refer to electronic products intended for industrial use, such as process control systems, analytical instruments, test & measuring instruments, and etc. ATM and mPOS are also included in this category.
- *Medical electronics:* Medical electronics are electronic instruments and equipment used for medical applications such as diagnosis, therapy, research, anesthesia control, cardiac control, surgery, and etc.
- *PV modules:* A photovoltaic (PV) module is a packaged, connect assembly of typically 6x10 photovoltaic solar cells. PV modules constitute the photovoltaic array of a photovoltaic system that generates and supplies solar electricity in commercial and residential applications.

### Value Chain of Electronic Products Industry

The electronics industry is generally comprised of three groups of players: brand owners, contract manufacturers and component suppliers. Brand owners subcontract and outsource a considerable amount of their manufacturing activities and use a range of suppliers for parts and components. Contract manufacturers are also classified as electronic manufacturing service providers (EMS), original equipment manufacturers (OEM) and original design manufacturers (ODM), depending on their activities.



Source: Frost & Sullivan

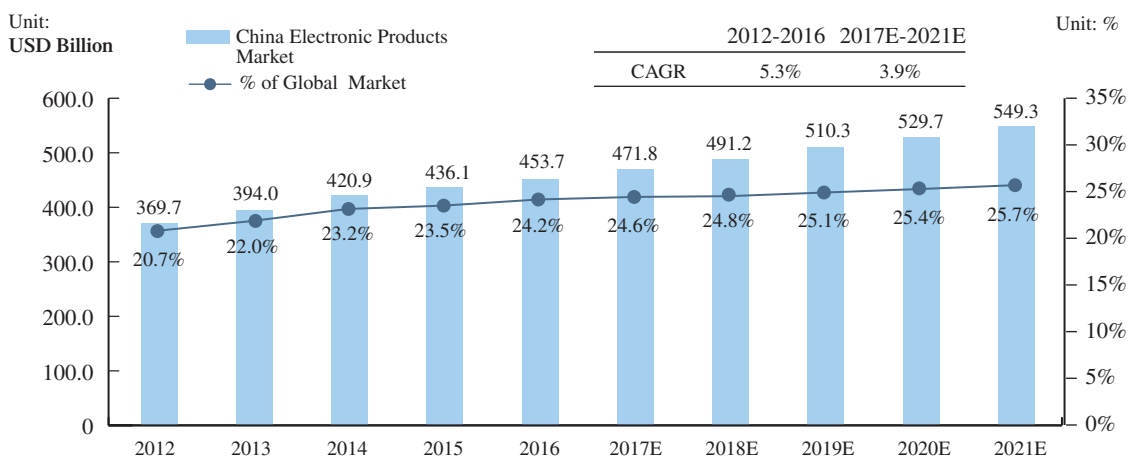
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### Market Size of Electronic Products Market

The PRC has overtaken the US as the world's largest electronic products market in terms of sales value since 2015. Sales value of electronic products market in the PRC grew from USD369.7 billion in 2012 to USD453.7 billion in 2016 with a CAGR of 5.3%. Meanwhile, the percentage of the PRC's share in global market has increased from 20.7% to 24.2%

It is forecast that sales value of electronic products market in the PRC will reach USD549.3 billion in 2021 with a CAGR of 3.9% from 2017 to 2021, and till then the PRC will account for 25.7% of the entire global market in terms of sales value.

**Sales Value of Electronic Products Market in the PRC, 2012-2021E**



Source: Yearbook of World Electronics Data, Frost & Sullivan

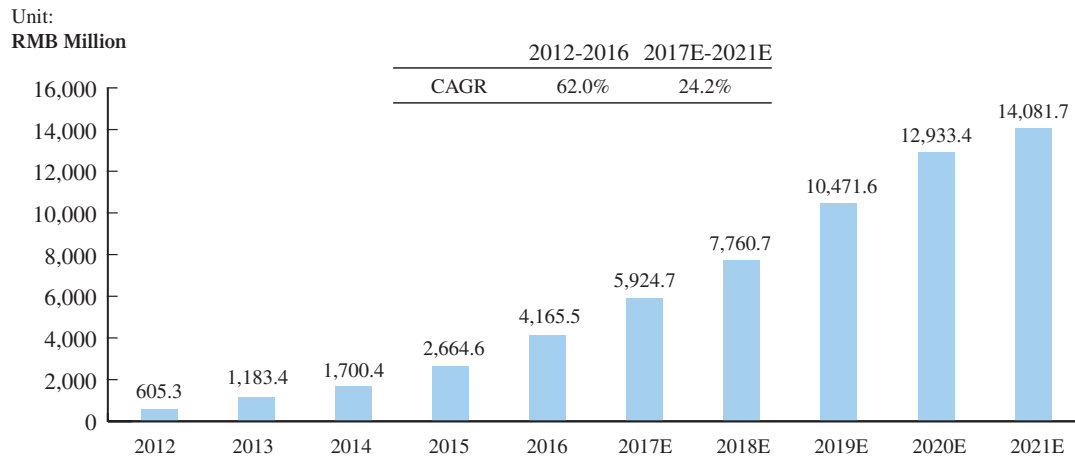
### Market Demand Analysis for Selected Electronic Products

#### mPOS

The sales value of mPOS terminal in the PRC has grown to RMB4,165.5 million in 2016, with a CAGR of 62.0% from 2012 to 2016. The market growth is primarily fuelled by the increasing adoption of mPOS solution due to lower cost and convenience, and also fuelled by government policy ("Notice on Promoting E-commerce Development (關於推動電子商務發展有關工作的通知)" released in 2016). The sales value of mPOS terminal in the PRC is expected to reach RMB14,081.7 million in 2021, representing a CAGR of 24.2% from 2017 to 2021.

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### Sales Value of mPOS Terminal in the PRC, 2012-2021E

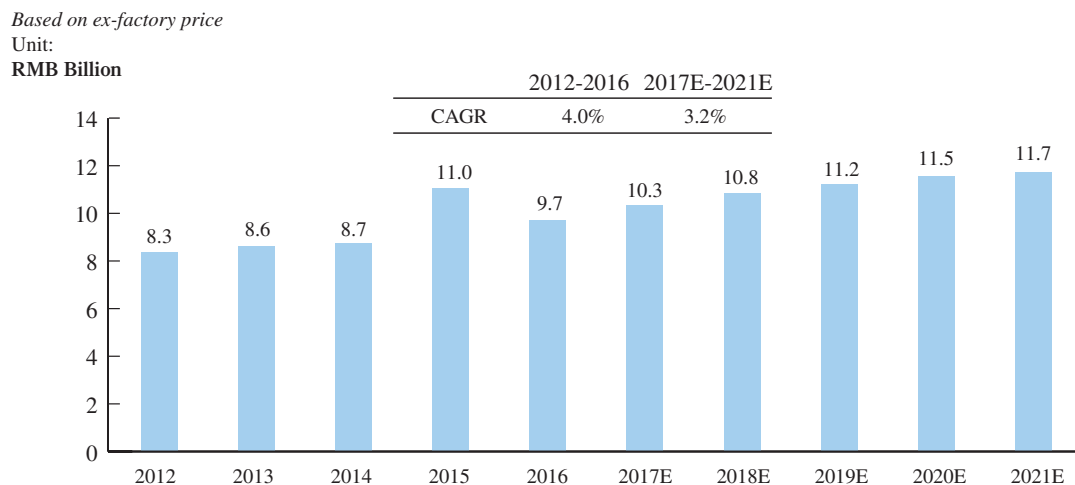


Source: Frost & Sullivan

### ATMs

The sales value of ATMs in the PRC has experienced a stable growth during the period from RMB8.3 billion in 2012 to RMB9.7 billion in 2016, representing a CAGR of 4.0% during the period. The PRC ATM market is expected to grow to RMB11.7 billion in 2021 with a CAGR of 3.2% from 2017 to 2021.

### Sales Value of ATMs in the PRC, 2012-2021E



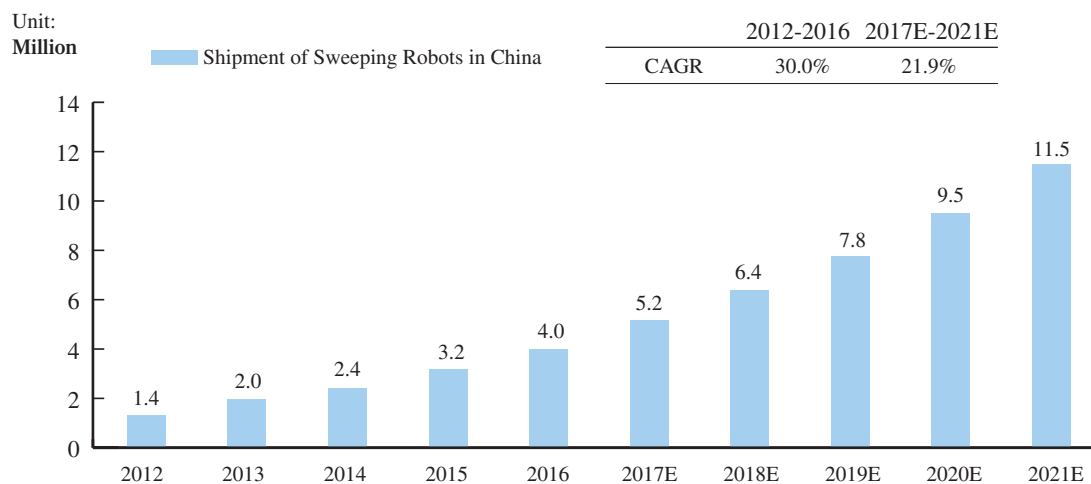
Source: Frost & Sullivan

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### Sweeping Robots

Nowadays, with the development of technology advancement, more smarter home appliances bring more convenience to people's lives and help people to save time and energy. At present, as consumers' awareness of sweeping robots increases and the technology is increasingly mature, the market demand of sweeping robots gradually increases. The shipment of sweeping robots in the PRC grew from 1.4 million in 2012 to 4.0 million in 2016 at a CAGR of 30.0%. In the next five years, the shipment of sweeping robots in the PRC is estimated to grow at a CAGR of 21.9% to reach 11.5 million by 2021.

**Shipment of Sweeping Robots in the PRC, 2012-2021E**



Source: Frost & Sullivan

## OVERVIEW OF EMS MARKET IN THE PRC

### Introduction of EMS

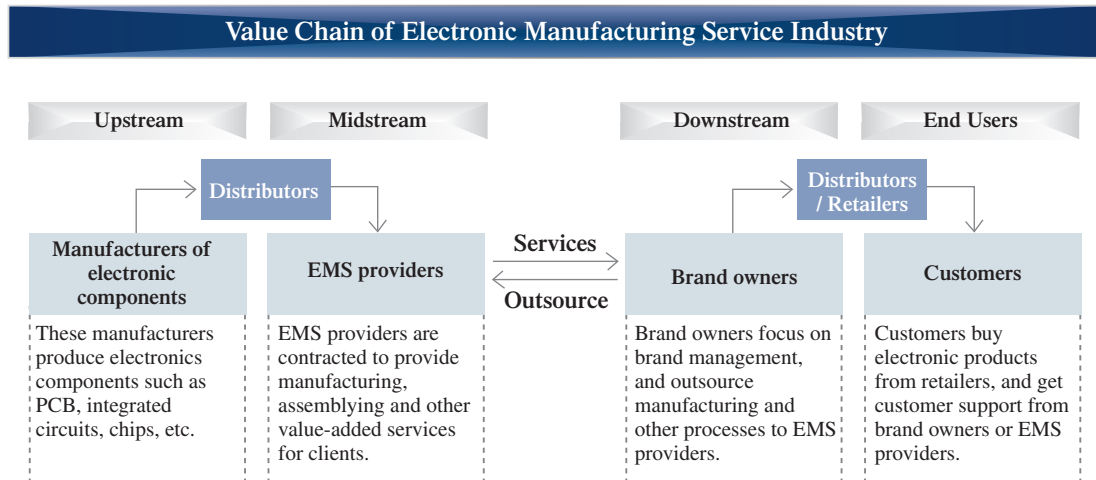
Electronic manufacturing services (EMS) providers are contract manufacturers that offer one-stop and integrated services ranging from product design and development, product manufacturing, supply chain management, logistics, after-sale services and other related services to brand owners. In general, products manufactured by EMS providers are sold under a client's brand name.

### Introduction of PCBA

Printed Circuit Board (PCB) is the most basic component of the electronic products. Printed Circuit Board Assembly (PCBA) is the process of soldering or assembly of electronic components to a PCB. A circuit board prior to assembly of electronic components is known as PCB. PCBAs are normally sold as stand-alone products to downstream users for onward production of various kinds of electronic products for different industries, including banking and finance, smart devices, telecommunications and new energy devices industries, etc.

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### Value Chain of EMS Industry



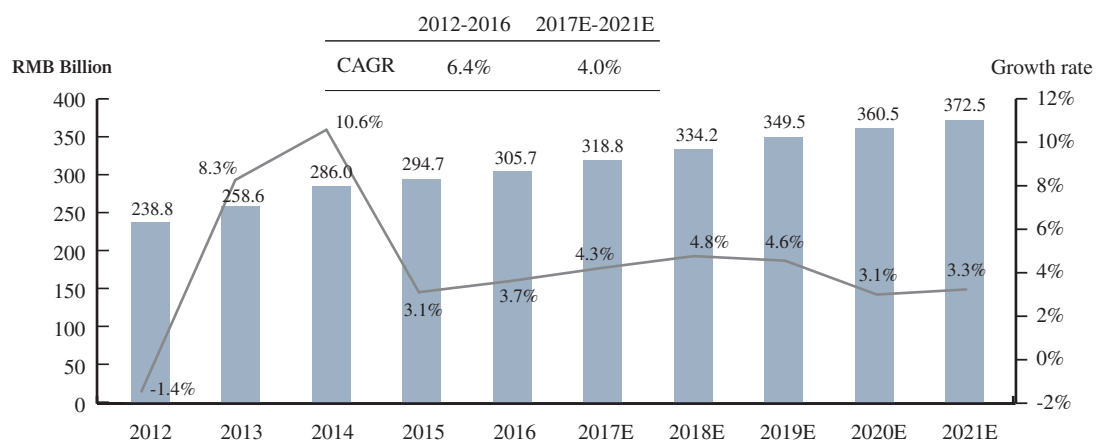
Source: Frost & Sullivan

### Market Size of PCBA Industry in the PRC

Supported by government policies such as “Electronic Information Manufacturing 12th Five-year Plan (電子信息制造業“十二五”發展規劃)” released by Ministry of Industry and Information Technology (中國工業和信息化部), the development of cloud computing, Internet of Things and big data industry, and the rising trend of export, the market size of PCBA industry in the PRC experienced an upward trend in general from RMB238.8 billion in 2012 to RMB305.7 billion in 2016 with a CAGR of 6.4%.

With the deepening of China’s informationization construction (信息化建設) and continuously increasing demand from downstream industries, the market size of China PCBA industry by sales value is expected to increase from RMB318.8 billion in 2017 to RMB372.5 billion in 2021 with a CAGR of 4.0%. PCBA industry in the PRC is getting increasingly fledged after the rapid development period and is transmitting its focus from low-end products to high-end products, under the pressure from reforming dilemma and rising cost.

### Sales Value of PCBA Industry in the PRC, 2012-2021E



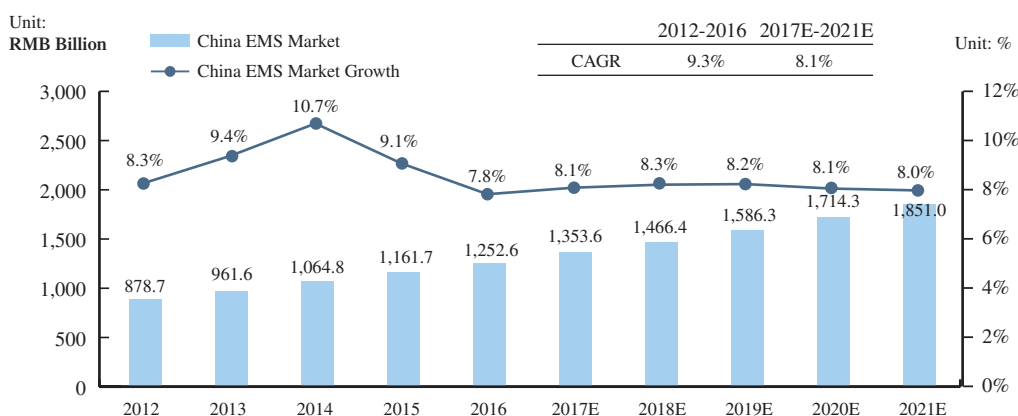
Source: Institute of Printed Circuits, World Electronic Circuits Council, Frost & Sullivan

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### Market Size of EMS Industry in the PRC

In recent years, growing demand from players along the value chain of the EMS industry and the continuous increasing penetration of EMS have driven EMS market in China. Sales value of EMS have reached RMB1,252.6 billion in 2016, with a CAGR of 9.3% from 2012 to 2016. With the booming domestic demand for electronic products, advances in manufacturing technology, and the offering of more value-added services, the market size of EMS industry in the PRC will continue to grow at a CAGR of 8.1% from 2017-2021 and reach RMB1,851.0 billion in 2021. The accelerated growth of EMS market during 2012 to 2014 is mainly due to the recovery of global electronics market; however, the growth of EMS market has slowed down and entered a steady growth since 2015.

Sales Value of EMS Industry in the PRC, 2012-2021E



Source: Frost & Sullivan

Penetration rate of EMS describes the rate that EMS providers captured as a percentage of electronics cost of goods sold. Based on the increasing acceptance of outsourcing as a viable option for the industry, penetration rate of EMS in global market has kept increasing from 18.7% in 2012 to 21.3% in 2016, and is expected to reach 23.4% in 2021.

### Market Driver of EMS Industry

*Thriving demand in global electronic products market will encourage EMS growth:* High demand from computer and storage, telecommunications, consumer electronics, automotive electronics, and military and aerospace fuels the EMS market in the PRC with great growth opportunities. The continuously expanding market of electronics industry indicates tremendous demand for electronic manufacturing services, therefore, electronic manufacturing service market will keep a sustained and steady growth.

*Penetration of EMS will continue to increase:* Electronic products continue to face challenges of shorter product lifecycles, fluctuating demand cycles, increasing pressures on quality, and line changeovers. To reduce cost, ensure product quality and stay ahead of innovation curve, brand owners will further rely on EMS providers in product design, manufacturing, supply chain management, and etc. As a result, the EMS market will keep a strong momentum with the increasing penetration of EMS.

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*Growing capabilities of EMS providers:* To provide quality products and services to their customers, EMS providers have constantly ramped up their manufacturing capabilities, procurement power and global network. In addition, EMS providers have also enhanced their design capabilities to provide higher-margin design services. The growing capabilities of EMS providers will raise the reliance of brand owners on outsourcing, and drive up the growth of EMS market.

*The PRC government's policies encourage market growth:* In 13th Five-year Plan (十三五規劃) and Made in the PRC 2025 (中國製造2025), the PRC government has emphasized on the importance of improving the innovation capabilities of manufacturing industries, and encourage investment in high-tech manufacturing industries such as new generation information technology, robotics, aerospace and renewable energy. These favourable policies will facilitate the development of electronic manufacturing industry in the PRC, and thus boost the growth of EMS market.

### Market Trends of EMS Industry

*Increasing consolidation and reorganization in the EMS industry:* Profit margins have been further challenged by increasing price pressures from brand owners and overall price sensitivity of the electronics industry. Many companies have been forced to consolidate, reorganized, and exit less profitable markets in an attempt to remain viable. Competitive EMS providers have looked to improve internal manufacturing and operation for cost savings, and EMS providers that are unable to keep up with new advances face the threat of becoming obsolete.

*Smart factories and increased automation are becoming common in the EMS market:* Many EMS providers are automating and using robotics to lower labor costs and to create smart factories. Increasing automation will also support the hybrid regionalization strategy that will encourage EMS providers to return to a manufacturing model based on proximity to customers, as opposed to seeking low-cost manufacturing solutions.

*Shift toward integrated services provider:* EMS providers are seeking increased penetration and responsibilities in design and new product introduction support. To differentiate from competitors, EMS providers should demonstrate their capabilities in offering integrated solutions which include supply chain management, inventory control, product lifecycle management, and etc. The focus in coming years will be on new manufacturing partnerships capable of providing competitive product/service value that goes beyond cheaper, faster, and simpler, and addresses a broader customer base.

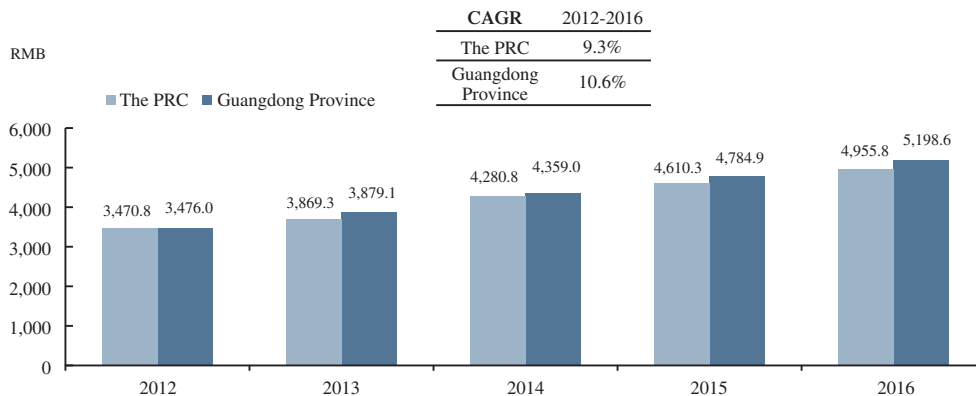
### Historical Price Trend of Wages of Manufacturing Workers and Raw Materials

The average monthly wage of employed persons in manufacturing industry in the PRC increased from RMB3,470.8 in 2012 to RMB4,955.8 in 2016, representing a CAGR of 9.3%. In Guangdong province, it increased from RMB3,476.0 to RMB5,198.6, representing a CAGR of 10.6% from 2012 to 2016. In general, the increasing wage was attributed to the shortage of labor supply in manufacturing industry and the effects of economic growth and inflation, and it has resulted in higher operation cost for manufacturers. The average wages of manufacturing workers in Guangdong province was generally higher than the national average.



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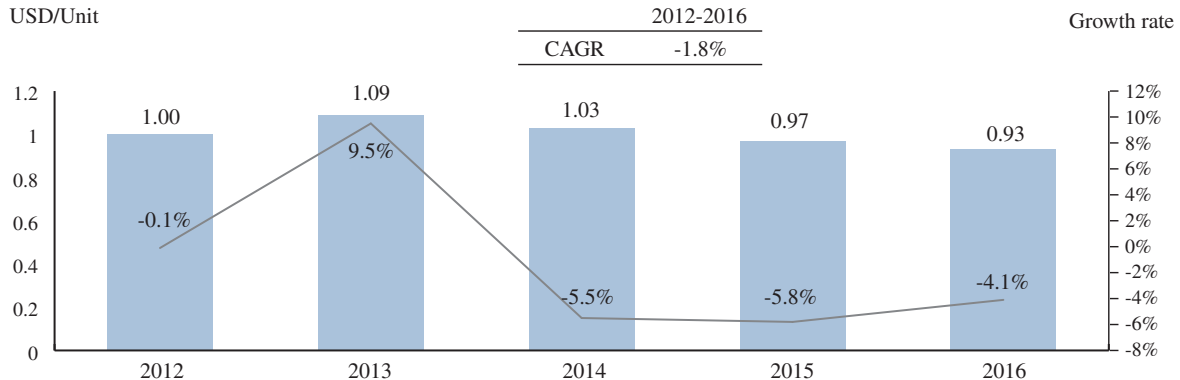
### Average Monthly Wage of Employed Persons in Manufacturing Industry in the PRC, 2012-2016



Source: National Bureau of Statistics of the PRC, Frost & Sullivan

The average price of electronic integrated circuits generally stabilized at around USD0.9/unit to USD1.1/unit mainly as the result of mature production technology. The price of electronic integrated circuits stood at USD1.00/unit in 2012 and increased to USD1.09/unit in 2013. From 2014 to 2016, the price decreased from USD1.03/unit to USD0.93/unit, which was mainly due to the decreasing prices of raw materials and growing competition among manufacturers with new entrants to the market.

### Average Price of Electronic Integrated Circuits in the PRC, 2012-2016



Source: China Customs, Frost & Sullivan

## COMPETITIVE LANDSCAPE OF EMS MARKET IN THE PRC

### Entry Barrier Analysis of EMS Industry

**Design and manufacturing capabilities:** Due to the rapid advances in technology and faster replacement of electronic products, brand owners require higher design and manufacturing capabilities from EMS companies to provide reliable products that meet the needs from the market.

**Contract manufacturer certifications:** In order to become the contract manufacturer of large multinational companies, an EMS company usually needs a long period of time for acquiring related certifications in terms of production process, quality management, working environment, and etc. Besides, local EMS plants have to follow the regulatory requirements in the PRC such as Product Quality Law, Work Safety Law, Environmental Protection Law, and etc.

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*Supply chain management capabilities:* An EMS provider usually covers a wide range of business from design, procurement, and manufacturing to logistics and after-sales services in various vertical markets around the globe. Therefore, a fully functioning and efficient supply chain system is necessary to deliver products and services to customers, and the capabilities to manage such complicated supply chain system is a major entry barrier for new EMS companies.

*Large capital investment:* To meet customers' requirement in terms of manufacturing capabilities, an EMS company has to invest a lot in fixed assets such as the establishment of plants and SMT lines, the purchases of testing and packaging equipment and etc. In addition, EMS company needs sufficient working capital to ensure procurement and daily operation. Therefore, large capital investment is another entry barrier for EMS companies.

### **Competitive Advantage of our Group**

*Advanced and automatic equipment:* Our Group has been equipped with automatic machinery and equipment such as automated SMT production lines and interchangeable PCB assembly production lines to ensure a broad range of production capabilities with high efficiency and the flexibility of catering to the needs of different customers.

*Comprehensive and one-stop services:* Our Group provides comprehensive and one-stop services for customers, which include procurement, assembly, testing, storage and logistics, and etc. The broad service scope and one-stop solution enable customers to minimize operational costs and streamline production process.

*Stable relationship with customers:* Our Group has established stable and long-term relationship with major customers, which include manufacturers of various kinds of electronic products.

*Experienced and dedicated management team:* Our Group is led by an experienced and dedicated management team, which has strong technical experience and substantial experience in the EMS industry. The extensive experience of the management team and their industry knowledge and in-depth understanding of the market enables our Group to assess market trends as well as to evaluate and manage our Group efficiently.