

## **Guideline for the Promotion of the Development of the National Integrated Circuit Industry**

After the agreement of the State Council, the *Guideline for the Promotion of the Development of the National Integrated Circuit Industry* is hereby published:

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The integrated circuit industry is the core of the information technology industry, it is a strategic, basic, and leading industry supporting national economic and social development and maintaining national security. Now and in the future, the period is an important period for the development of the integrated circuit industry characterized by major opportunities and challenges. This outline has been formulated to accelerate advancement of the nation's integrated circuit industry.

#### **I. Current Status and Circumstances**

In recent years, with market demand and government support, the national integrated circuit industry has experienced rapid growth and has achieved improvement in general competency, and integrated circuit design and manufacturing industry has been keeping pace with global progress. Packaging and testing are near an advanced international level, with some key equipment and materials being adopted in domestic and international production lines. Emerging leading companies are gaining ground in the global market, and the effects of industry clustering are becoming increasingly obvious. However, the integrated circuit industry still faces a number of prominent problems, including finance difficulties of integrated circuit manufacturers, weak continuous innovation, disconnection with market demand, loose industrial chain links, outdated industry policies, etc, and the industrial development level still has a huge gap with the advanced international level, and mostly rely on imports. It is still difficult to achieve national industry core competency and to enforce information security.

At present, the global integrated circuit industry is going through an important phase of adjustment and transformation. From one perspective, the global market order is going through an accelerated adjustment period, investment volumes are rapidly increasing, and market share is becoming increasingly concentrated among dominant companies. From another perspective, mobile intelligent terminals and integrated circuits are experiencing explosive growth and new trends like cloud computing, the Internet of Things, and big data are progressing at a rapid pace, which in turn will lead integrated circuit technology in new directions. China is the biggest integrated circuit market in the world, and market demand will keep rising at a fast pace. Under the new situation, the national integrated circuit industry faces great challenges and also seeing great opportunities, and shall make use of market advantages, provide a favorable environment for progress, boost company vitality and creativity, and motivate the whole industrial chain for continuous growth, and strive to catch up with the advanced international level and achieve development of the integrated circuit industry by leaps and bounds.

#### **II. General Requirements**

##### **(I) Guiding ideology.**

Guided by Deng Xiaoping Theory, the important thinking of the "Three represents," and the scientific development concept, we will seek thorough understanding of the spirit of the Second and Third Plenums of the 18<sup>th</sup> Party Congress, implement the decisions of the Party Central Committee and the State Council, allow the market to play the decisive role in resource allocation, improve government function, and encourage enterprises to be the main players. With demand as the orientation; overall mechanisms and

systems for traction; design in the leading position; manufacturing as the basis; equipment and materials for support; and innovation of technology, models, and systems as the driving force, strive to break through bottlenecks, make focused progress and overall improvement, achieve development by leaps and bounds, and give substantial support to the transformation of the economic development model, the maintenance of national security, and the increasing of comprehensive national power.

## (II) Basic principles.

Being driven by demand. Relying on the market, serve popular major whole unit and information consumption demand, improve the industry's market adaptability and effective supply level, and build an industrial chain consisting of "integrated circuit chips, software, whole units, systems, and information services."

Being powered by innovation. Encourage enterprises to be the main players in technical innovation to increase research and development capacity, integrate completion of national key special science and technology projects with making breakthroughs in a set of key integrated circuit technologies in conjunction with the national technology major projects, and promote both whole unit innovation and business model innovation.

Taking software development into account. Strengthen coordinated innovation in integrated circuit software and hardware, use improved hardware to motivate software development, use upgraded software to stimulate hardware advancement, and promote elevation of the overall development level of the information technology industry.

Focusing on making breakthroughs. Emphasis must be put on integrating market demand with technology development and prioritizing the rapid development of key areas with national security importance, vast market potential, and solid foundations.

Opening up development. Fully utilize global resources, promote open innovation and new development along the industrial chain, strengthen international ties and cooperation, and elevate the industry's position and influence within the global industrial competition framework.

## (III) Development goals.

By 2015, integrated circuit industry development systems and mechanism innovations to bring obvious success and financing platforms and policies suited to laws of industrial development should be established. Integrated circuit industry sales revenue to surpass 350 billion RMB; integrated circuit designs for mobile intelligent terminals, internet communication, and other major areas to be approaching the top international level; mass production to be achieved in 32/28 nm technology manufacturing; middle and high-end packaging and testing sales revenue to constitute over 30 percent of the total revenue of the packaging and testing industry; and key 65-45 nm equipment, 12 inch wafers, and other key materials to be adopted in production lines.

By 2020, the gap to be narrowed between the integrated circuit industry and the advanced international level, average annual growth of sales revenue to over 20 percent, and the ability for continuous growth to be greatly improved. Integrated circuit design to be in a leading position internationally in mobile intelligent terminals, internet communication, cloud computing, the Internet of Things, big data, and other major areas and an industry ecosystem should be basically established. 16/14 nm manufacturing technology to be brought into mass production and packaging and testing should be at a leading position internationally. Key equipment and materials to be brought into the international procurement system and

basic construction of technologically-advanced, secure, reliable integrated circuit industry systems to be complete.

By 2030, the main links of the integrated electronic circuit industrial chain to reach an advanced international level, with some enterprises entering the ranks of the international front runners and achieving development by leaps and bounds.

### **III. Main Tasks and Priorities**

(I) Strive to develop the integrated circuit design industry. With a focus on major industrial chain links, strengthen integrated circuit design, software development, system integration, innovation of content and service, etc., and make rapid integrated circuit design growth the driving force in integrated circuit manufacturing. With a focus for the near future on mobile intelligent terminals and internet communication, develop popular chips for mobile intelligent terminals, digital TVs, internet communication, and smart wearable devices along with the applicable operating systems, while improving the overall competency of the information technology industry. Make full use of market mechanisms in their role of guiding and promoting integrated circuit industry mergers and regroupings. Speed up core technology research and development in emerging areas like cloud computing, the Internet of Things, and big data. Based on new industry trends and applications, develop key integrated circuits for information processing, sensors, and novel storage, as well as basic software for cloud operating systems, and the industry will begin the race to the top for its future. Area by area, category by category, gradually make key integrated circuit and embedded firmware breakthroughs for smart cards, smart grids, smart transportation, GPS, industrial control, financial electronics, automobile electronics, and medical electronics, as well as strengthen and support further integration of informatization and industrialization.

(II) Speed up development of integrated circuit manufacturing. Take advantage of the favorable opportunity generated by technological transformation to break through financing bottlenecks and continue to promote advanced production line construction. Speed up the increasing of 45/40 nm technology production capacity, speed up construction of 32/28 nm technology production lines, and quickly build up production capacity. Speed up three-dimensional technology development and promote 22/20 nm and 16/14 nm technology production line construction. Vigorously promote development of specialty production lines for analog and mixed analog-digital circuit, micro-electro-mechanical systems (MEMS), high-voltage circuits, radio frequency circuits, and other technologies. Increase overall integrated circuit manufacturing capabilities, let manufacturing drive design, and let production lines drive equipment and materials.

(III) Increase the technology level of the advanced packaging and testing industry. Vigorously promote mergers and regroupings of domestic packaging and testing companies and improve industry concentration. To fulfill the requirements of integrated circuit design and manufacture technology upgrading, develop and industrialize advanced packaging and testing technologies, such as chip-scale packaging (CSP), wafer-level packaging (WLP), through-silicon via (TSV), and 3D packaging.

(IV) Make breakthroughs in key integrated circuit industry equipment and materials. Strengthen integration of integrated circuit equipment, materials, and technologies; research and develop key equipment like lithography machines, etching machines, and ion implanters; develop photoresist, large wafers, and other key materials; enhance cooperation between integrated circuit manufacturing companies and equipment and materials companies; and accelerate the process of industrialization and improve supporting industries.

### **IV. Safeguard Measures**

(I) Strengthen party leadership. Set up a national integrated circuit industry development leading group to be responsible for top-level coordination, top-level planning, top-level resource allocation, and major problem solutions related to integrated circuit industry development. Set up a consultation committee to conduct investigation and research on major development issues and policy measures, and to provide assessment and consultation.

(II) Set up a national integrated circuit industry investment fund. The national integrated circuit industry investment fund (hereafter referred to as "the fund") to mainly serve as a platform to attract large enterprises, financial institutions, and social funds to support integrated circuit industry development and to promote industry upgrades. The fund will focus on supporting integrated circuit manufacturing with market-oriented operation, with regard to design, packaging, testing, equipment, and materials, improve production capacity, promote mergers and regroupings, regulate corporate governance, and promote formation of a virtuous cycle of self-development. Encourage setting up local integrated circuit industry investment funds and encourage various social venture capital and equity investment funds to enter the industry.

(III) Increase financial support. To take advantage of both policy financing and commercial financing for a complementary effect, encourage the Export-Import Bank of China to strengthen services and bring the integrated circuit industry within its scope; encourage and guide domestic development banks and commercial banks to continually provide financial support to the integrated circuit industry; create customized financial products and services for the integrated circuit industry; encourage integrated circuit companies to go public for domestic and international financing, to use issuance of debts as financing instruments, and to use the National Equity Exchange and Quotations for accelerated development; encourage development of loan guarantee insurance and credit insurance; and explore and develop insurance products and services appropriate to the integrated circuit industry.

(IV) Provide tax incentives. Further enhance earnest implementation of the *Notice of the State Council regarding the Issuance of Policies for Encouraging Development of the Software Industry and Integrated Circuit Industry* (Guo Fa [2000] No. 18) and *Several Policies for Further Encouraging the Development of the Software Industry and Integrated Circuit Industry* (Guo Fa [2011] No. 4); provide and improve corresponding regulations and associated initiatives; guarantee policy stability; and provide income tax incentives for businesses in integrated circuit packaging, testing, materials, and equipment. Provide and improve tax incentives such as those related to income tax, value added tax, and business tax on integrated circuit company mergers and regroupings. Continue the import tax exemption policy on qualified imports of major integrated circuit equipment, key integrated circuit components, and materials, as well as on imports of major crucial equipment required by special key science and technology projects that is domestically unavailable, and update import tax exemption lists or catalogs regularly.

(V) Promote broadened application of secure and reliable software and hardware. Organize implementation of plans for broadened application of secure and reliable software and hardware, following the principles of breakthroughs in key areas, division of labor, and gradual implementation, we must promote broadened use of technologically-advanced, secure, and reliable integrated circuits, basic software, whole units, and systems. Government purchasing for domestic-demand-expanding civil projects and government-funded major information technology projects should give preference to products built with secure and reliable software and hardware. Encourage basic telecommunication and internet companies to purchase whole units and systems built with secure and reliable software and hardware. Fully utilize policies and measures designed for increasing information consumption and promote the development and application of terminals built with secure and reliable software and hardware. Speed up building of standards systems for new applications such as mobile internet, cloud computing, the Internet of Things, and big data, while supporting the development and application of secure and reliable software and hardware.

(VI) Strengthen industry innovation. To encourage establishing mechanisms for cooperative innovation efforts along the industrial chain and support the development of industry alliances, encourage companies to set up integrated circuit research and development divisions, to connect with research institutions and universities, and to conduct research on common key technologies prior to the competition phase; attract top experts from outside the country for strong continued growth; strengthen integrated circuit industry intellectual property application and protection; establish a risk management system for intellectual property involved in national major projects and provide guidance on establishing strategic intellectual property alliances; actively explore relevant direct financing methods and asset management systems; and accelerate the establishment of standards for major new areas in the integrated circuit industry and use technical standards to their best effect.

(VII) Increase the ability to train talented personnel and attract talented personnel from abroad. Establish a complete training system for the integrated circuit industry, support microelectronics development through joint efforts between universities and integrated circuit companies, and set up and improve exemplary microelectronics institutes and vocational training schools. Promote continuing education programs designed for updating the knowledge of technical personnel and place emphasis on skill maintenance and training for high-level, highly-in-demand, and high-expertise professionals through various channels. Conduct training abroad for specific situations and promote establishment of international training camps for software and integrated circuit industry professionals. Secure funding through existing channels to attract talented software and integrated circuit personnel from abroad. Vigorously promote introduction of talented personnel into the integrated circuit industry through the "Thousand Talents Program," prioritizing introduction of outstanding entrepreneurs and high-quality technical teams and management teams through well-thought-out policies. Encourage integrated circuit companies to strengthen their ties with research institutions abroad. Establish an incentive system to encourage innovation, by setting up benefit distribution policies such as distribution of equity shares, stock options, and bonuses for technical personnel according to individual technical contributions.

(VIII) Continue to expand opening up to the outside. Further improve the industry environment, vigorously work to attract foreign investment, technologies, and talented personnel and encourage international integrated circuit companies to set up research, manufacturing, and operations centers in China. Encourage domestic integrated circuit companies to strengthen international cooperation, integrate international resources, and open up international markets. Fully utilize cross-strait economic cooperation mechanisms and encourage the integrated circuit industry to strengthen cross-strait technical and industrial cooperation.